CrimethInc.'s

Collected Demonstrator's Guides

On how to protect yourself at protests

through word of mouth, flyers, or social media in order to create an opportunity to discuss ideas and strategies. It is necessary to cultivate opportunities for people to meet, spaces where our perspectives can be shared, readings can be spread, and we can build confidence that we can arrange our whole lives via self-organization without need of governments, hierarchy, or capitalism.

Further Reading

- Bodyhammer: A zine from the turn of the century, discussing shields, helmets, body armor, group movement, shield walls, and other formations.
- How the White Overalls Beat the Cops with Tactics of Radical Defense

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CrimethInc.'s

A DEMONSTRATOR'S GUIDE TO...

A collection of guides on how
to protect yourself at protests

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These guides were originally published by CrimethInc. between 2020 and 2025 and can be found on their website at: crimethinc.com

These guides are primarily contextualized for protesters in the U.S. but draw from resources, knowledge, and experiences from around the world.

Appendix: Be Ready for the Uprising

We have seen shields deployed in uprisings in Chile and Hong Kong in 2019, and in cities like Portland during the George Floyd rebellion of 2020, and have witnessed reinforced banners in struggles such as the fight to defend Weelaunee Forest in Atlanta.

Right now, unrest is deepening. Here are some words of encouragement for uprisings.

1. **Revolt**: A revolt is comprised of combative direct action against the forces of authority. If this kind of street activity is an option for you, focus on it. In our city, we have sometimes been caught up focusing on writing projects, social media, and big meetings during moments of unrest when we could have been making immediate plans for street action or targeting infrastructure. Uprisings are the time to put everything aside. These are the moments we have been waiting our whole lives for. Let’s plan actions that aren’t ritualized resistance, that show just how far we can take things and how seriously we take this moment.
2. **Affinity**: Focus on working with the small group of people you already deeply trust. These should be people you are aligned with, with whom you share ideas, values, and a comparable degree of risk tolerance. Meet to form plans and to prepare so that you can arrive confident and coordinated, especially at events that are likely to become unpredictable. At the minimum, this could look like a quick meeting in the morning, preparing tools together midday, and going to a protest at night. Stick together and look out for each other. Do what it takes to protect your comrades. Show them how much you care about them during, before, and after.
3. **Self-Organization**: To become real revolutions, revolts require anarchist ideas and social organization. Make a clear list of short-term priorities to make the best of these fleeting moments of insurrection. Do not become overambitious. If you have time outside of street activity, pick a project and do a good job of it. This could mean creating shields or other tools, engaging in social media work, distributing flyers, organizing small-group invitational actions away from big crowds, or planning actions in larger groups and coalitions. You could call for neighborhood assemblies

to keep up with events. This banner design is light enough that it could be delivered by bicycle.

Other strategic questions include figuring out which area of the action to position the banner in, especially if you intend to employ it for both distraction and defense.

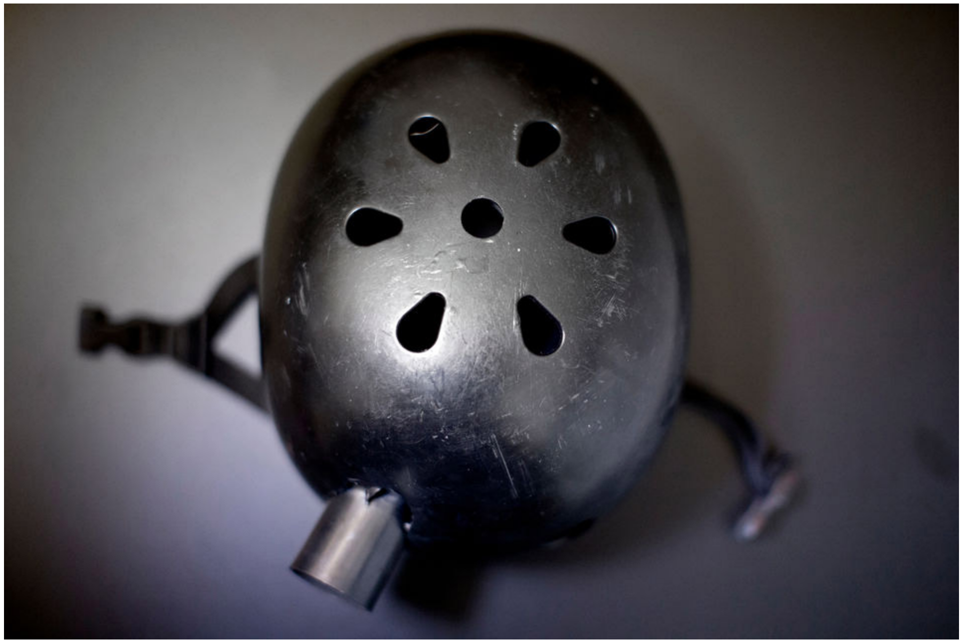
Do not hesitate to abandon the banner if necessary. We usually drop ours once an action is over and it is time to disperse. The banner is a tool, not property to retain. The banner is not a person. Protect people over banners. It is ideal if police cannot recover your banner in order to learn its construction and perform forensic tests on it, but it’s not worth risking arrest or identification for that purpose.

People elsewhere in the world have experimented with rolling floats built on metal shopping carts or other devices, which can serve as mobile barricades or even as rams.

We don’t see reinforced banners as a substitute for building stationary barricades, which can provide equivalent protection to a larger group of people in a given location.

A Demonstrator’s Guide to Helmets

As violence intensifies from police, federal officers, and fascist groups around the country, it’s important to think about how to protect ourselves. No one should have to choose between preserving bodily safety and organizing in our communities—yet batons, impact munitions, and street attacks are designed to force us to decide between the two. It’s not a question of whether you employ confrontational tactics—nowadays, anyone who is in a protest situation could become a target. By taking the proper precautions, we can mitigate the risks while continuing to show up for each other. This guide explores a wide range of protective headgear, detailing the advantages and disadvantages of each, so you can pick out what’s best for you. The life you save could be your own.



Aaron Cantu’s helmet after a police officer in Portland, Oregon intentionally fired an aerial flash-bang grenade directly at his head. If he had not been wearing a helmet, he would probably have been killed.

Executive Summary

If you don't have time to read the entire text, here's what you need to know:

If you anticipate that no one else will be wearing a helmet, wear something concealable or inconspicuous—a bump cap baseball cap, a low-profile skate helmet under a hood, or a bicycle helmet—so as not to make yourself a target. If you anticipate that many people will be wearing helmets, wear the best helmet you can get your hands on, such as a tactical bump helmet or ballistic helmet.

Some Options

High-end: Level IIIA ballistic helmet, such as the $500 Hard-Headed Veterans ATE, or a discount Chinese-made model that is still tested to a high standard, such as the $200 LongFri model.

Cheaper tactical: Either a name brand "bump helmet" for $100-200, or an airsoft helmet that looks like one for $40. If you go with the latter, swap out the pads for real pads, which cost another $40, and do not expect it to provide nearly as much protection.

Dirt-cheap option: Find the cheapest skate helmet you can that still advertises meeting various certifications. It should be about $20.

Low-key option: $20. Buy a "bump cap" (not a "bump helmet")—a bit of a hardhat built into a baseball cap.

In an emergency: A half or three-quarters motorcycle helmet, a half-mask hockey helmet. A lacrosse helmet with the facemask removed. Any other helmet you can find.

Hard-Headed Veterans ATE helmet.

Using Reinforced Banners

Form a crew that will carry the banner. Because they will be taking up positions at the front line of any conflict, they should be equipped with helmets, goggles, masks, and gloves. They should discuss their goals and plans in advance, including their specific shared commitments to each other and their backup plans for various scenarios.

It's important to develop a shorthand to communicate and make decisions rapidly, so as to be able to move swiftly when necessary. Go over this ahead of the action.

Organize a support team for those carrying the banner. These people can be equipped with a variety of tools to defend the banner carriers, including umbrellas. We have seen crowds use laser pointers, projectiles, paint-filled fire extinguishers, and other tools from behind banners.

The greatest points of vulnerability are at the edges of the banner. You can address this by flanking the banner with a crowd bearing shields and umbrellas, or perhaps by keeping a wall to one side of you. Be careful not to risk being surrounded—the chief source of security for those carrying the banner is the crowd controlling the area behind them, which can back them up or pull them to safety if need be. If they can get close enough, police may also try to grab the top or bottom of the banner in order to pull it down or up. Stay mobile and make sure that they are discouraged from doing so.

You could coordinate discreetly in advance with other crews you trust so that they know that you are bringing a reinforced banner. Discuss how your plans might interact with theirs.

You should identify your goals in advance and discuss when and where to deploy the banner. It may be necessary to smuggle it into the area where the action will take place folded up—for example, disguised as a pile of protest signs—in order to maintain the element of surprise.

Police will not necessarily let you enter a potential conflict zone with a reinforced banner if they can identify it in advance. In especially challenging conditions, you could bring it into the area ahead of time and leave it somewhere relatively safe (for example, hidden on an inactive construction site), or wait for a march to get started and then join it with the banner while police are scrambling

5.) **Cover the Edges**: Cover the edges of the metal with several layers of duct tape so that it is softer, in case the banner strikes you or someone else.

Repeat the above steps three times so as to create three segments for your banner.

6.) **Zip Ties to Connect the Segments**: Connect the three segments to each other by adding zip ties along their adjoining edges. So, for instance, in the graphic showing a two-person banner, the left and right pieces are connected by zip ties running through the middle. These will function as hinges, enabling you to fold the banner.

7.) **Painted Tarp**: Attach a long tarp across the front of all three pieces, wrapping the edges around onto the back of the banner and zip-tying them tightly into place. The tarp is the *banner* component of the reinforced banner. Paint something on the tarp such as a slogan or sign. If you use spray paint to make your job easier, consider using stencils for better results.

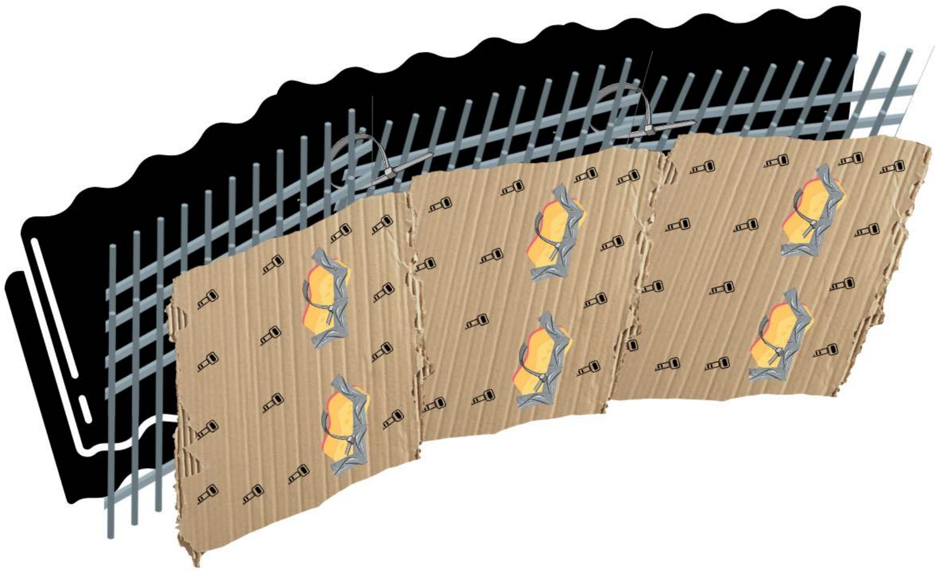
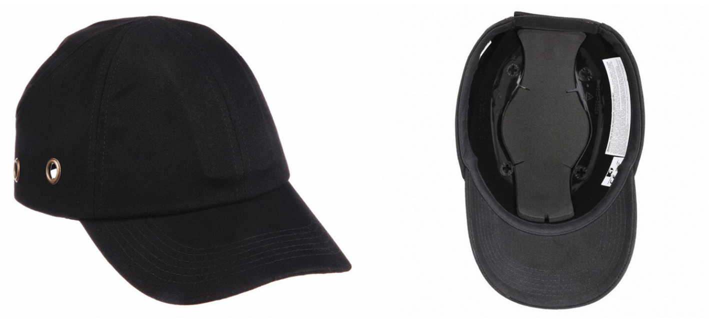


Diagram V.



A bump cap.

Why Helmets?

Our heads are fragile. Police know this—so they aim for them. Fascists do the same. It is smart to wear a helmet in a lot of protest situations.

As with all gear, it’s always important to think in terms of tradeoffs. If you’re the only person with a helmet, you might attract more attention to yourself than you want. If no one else will be wearing a helmet, consider wearing a concealable helmet. If you anticipate that everyone will be wearing helmets, make sure you’re wearing a good one.

Mobility, visibility, and flexibility are important—whether we’re talking about a particular item of gear or our movements as a whole. The police will almost always have more access to resources than we do; it’s usually a mistake to get drawn into head-to-head confrontations under static conditions. Their weaknesses are that they tend to react slowly to new information and that they often lack motivation and creativity. When choosing equipment and tactics, we should always aim to stay fluid and mobile, being careful not to weigh ourselves down attempting to hold a fixed position.

All that said—you can’t really go wrong wearing a helmet to a protest. Cheap bicycle helmets have saved people’s lives this year. If you don’t want to spend any money, then wear whatever you have available. A skate helmet is great. A bicycle helmet is better than nothing. A full-face motorcycle or motocross helmet is expensive, limits your vision and hearing, and presents a variety of other downsides—but if you catch a tear gas canister to the brow, you'll be glad you wore it.

There is no helmet that will protect you entirely from blows or shots to the head. There is no "concussion-proof" helmet available to football players: it would require a tremendous amount of foam. Like all protective gear, all a helmet can do is mitigate certain risks.

People tend to fixate on the shell of a helmet—assuming, for example, that since a ballistic shell that can withstand gunfire, it will protect your head better than a hockey helmet. But a ballistic shell is only intended to protect your head from gunfire—it might not be as effective at protecting your head from a hockey puck. And a hockey helmet might not protect your head in a road accident the way a bike helmet could.

With helmets, both the shell and the padding matter in roughly equal proportions. If a projectile penetrates the shell, the padding won't do much. Yet the padding is what protects against blunt impact, presuming the shell itself is not penetrated.

Ballistics is a complicated field. We spoke at length with an engineer in the process of preparing this series. The long and short of it is: it is very hard for a layperson to predict which objects will penetrate which surfaces and how much force will be transferred. We can learn the kinetic energy (in joules) of various less lethal munitions and we can learn the standards that various helmets are certified according to—but it is difficult to draw reliable conclusions on the basis of this information. In short, non-ballistic helmets are certified to resist substantially less kinetic energy than might be imparted by a less-lethal weapon.

Helmets mitigate risk. They don't nullify it.

Fitting a Helmet

Helmets come in a variety of sizes and each manufacturer employs different sizing patterns. It's worth getting a tape measure to measure the circumference of your head before shopping for a helmet, especially if you're buying it online. If you don't have a tape measure, use a piece of string, then measure the length of the string.

4.) **Handles**: As depicted in Diagram IV., the handles require three components: 1) sponges 2) zip ties 3) duct tape. The sponges should be fat and shock resistant. Your hand should rest comfortably on the sponges, shielded from impact. Cut a hole through the plastic or cardboard layer so that the sponge can be zip-tied all the way through to the metal. Create another hole in the cardboard above and below the sponge so that you can lace duct tape through the metal. Lace the duct tape many times over until it forms a durable handle. Make sure your hand fits in between the duct tape handle and the sponge.

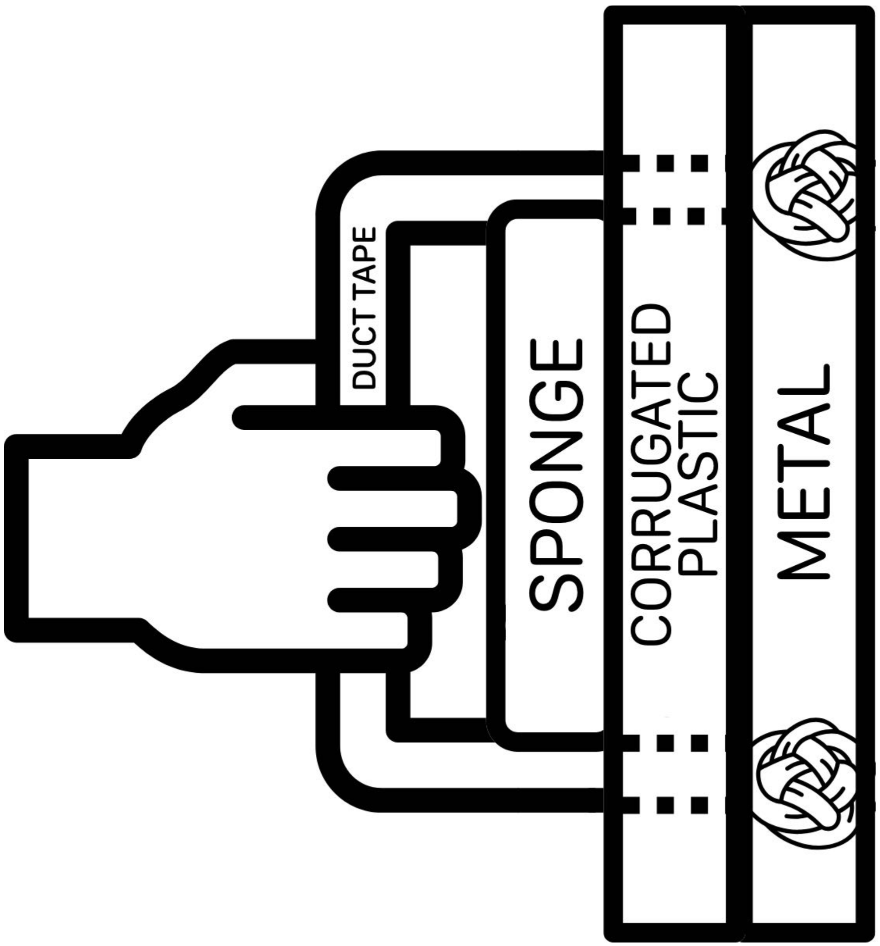


Diagram IV.

Make two handles: one higher, another directly beneath the other, both centered horizontally. You should now be able to lift the banner.

2.) **Corrugated Plastic**: We use a sturdy but shock-absorbent corrugated plastic, the sort that is often used in yard signs. Sturdy cardboard could fulfill the same purpose. In any case, you want this to be larger, in length and height, than the metal part. This will protect you from hitting yourself with the metal once you connect the cardboard behind the metal.

3.) **Zip Ties**: Use zip ties to connect the corrugated plastic or cardboard to the metal. Make sure the second layer is completely firm against the metal.

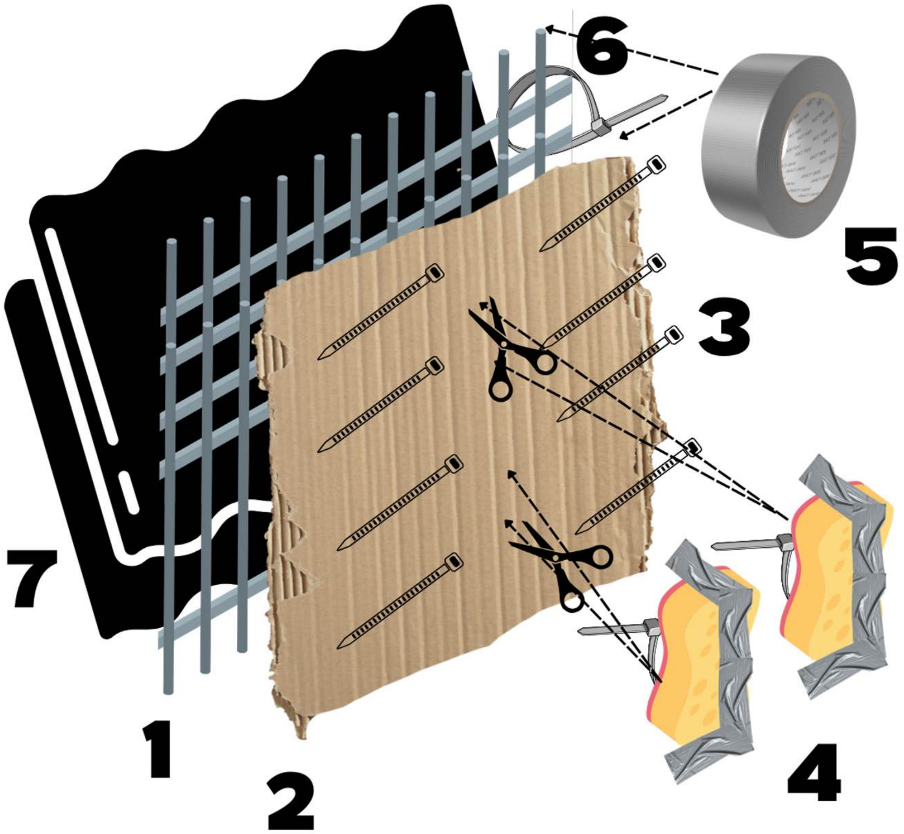


Diagram III.

A lot of helmets are adjustable—you can fit them either by adding or removing padding or by tightening or loosening a headband. Hard hats in particular are eminently adjustable, though we don’t particularly recommend them. Regardless, it’s best to buy a helmet that fits you well. If you’re between two sizes, you should probably go with the larger size; but a helmet that is too loose can fall into the wrong position at inconvenient moments, even blocking your vision. A helmet that is too loose will likely absorb less impact, because the force of a blow can push the side of the helmet into your head, essentially making the helmet itself impact you.

With padded helmets, you want it tight enough that it takes a bit of effort to get it on, but not so tight that it feels confining. To test the fit of a tactical helmet, shake your head from side to side with some force without the chinstrap on: the helmet should not move.

Types of Helmets

For the purposes of this article, we’ll divide helmets into three basic categories based on how they’re designed. There are **suspension helmets,** which use a hard layer on the outside and a suspension system inside to absorb impact. This category includes most construction hard hats, older military helmets, and some climbing helmets. There are **crash helmets,** which rely on crushable foam, usually paired with a hard layer. These are generally designed with the assumption that they will be destroyed on impact. Bicycle, skate, ski, motocross, and motorcycle helmets are all crash helmets. And finally, there are **padded helmets,** which use a hard outer shell and non-crushable padding inside to mitigate impact. This includes modern military and tactical helmets as well as some sports helmets, including football, lacrosse, and hockey helmets.

Crash helmets generally provide the most protection from a single impact, but they lose their protective capacity after one blow. Suspension helmets are light, cheap, and durable, but are often not rated for side impact and generally less protective overall. We recommend padded helmets, which are often designed for repeated blows. There’s a reason soldiers wear them.

Suspension Helmets

Suspension helmets have the advantage of being cheap and of allowing air to flow over the head, but are generally less effective against blunt impacts. We don't recommend them.

The classic hard hat.

Hard Hats

First, and most common, is the hard hat. Most hard hats are good for protecting your head from falling objects, but not as useful for mitigating other threats. Many lack even a chinstrap, which makes them unreliable in situations that could involve running, falling, or grappling. Worksites are increasingly replacing hard hats with "safety helmets," some of which use suspension systems, some of which use crushable foam or padding for the sides, some of which use a combination. If you're going to use a hard hat, look for a "Type II" helmet, which includes non-crushable padding on the sides and is rated for side impact as well as top impact. These are much less common.

Hard hats have a very "civilian" look, which can be useful for optics.

A typical climbing helmet.

Climbing Helmets

Climbing helmets are similar to "Type II" hard hats in that they are rated for side impact as well as top impact. They also sit closer to the head than a hard hat. Generally, they are more comfortable and offer better mobility.

Anecdotally, we hear that climbing helmets that are tested to the European ASTM F1492 standard offer effective protection against baton blows.

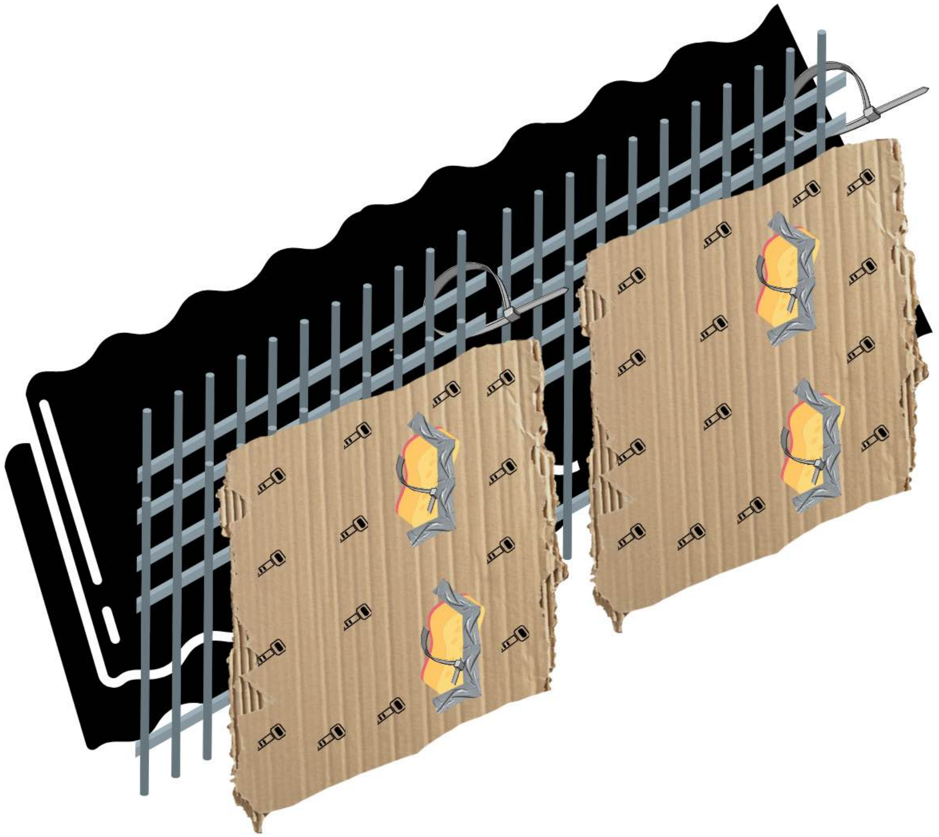


Diagram II.

Fingerprints: We recommend that you use gloves while interacting with the materials that you use to make the banner and while handling the banner itself. It's not illegal to make a reinforced banner, but nonetheless, for a variety of reasons, you might not want to be connected with one.

The following legend elucidates the seven elements of Diagram III.

1.) **Metal**: We get our metal frame by cutting out a piece of temporary construction fencing. You can use bolt cutters. The kind of metal you want is firm and light—not flimsy or bendy like chain-link fencing. The size you want to cut out is roughly 3.5 feet in height by 2.5 feet in length. In measuring, our aim to make sure that when crouching low, we can cover our bodies with the metal, and when standing up straight, we can duck our heads behind the metal while still covering some of our legs.

Similarly, it is probably advisable to make sure that any sharp edges are covered with duct tape in case you fall on your shield or hit yourself with it. In our city, we made some shields with a trash bin part and wrapped them thickly in duct tape so that the cardboard stuck on firmly, and made handles using duct tape as well. Basically, shields are easy to make with items you can find lying around.

"Different shield designs are better for different situations. Like umbrellas and leaf blowers, shields can do things in large numbers that they cannot do alone. If you want to form a shield wall, ideally your shield should be big enough to cover your body. But the bigger your shield is, the heavier, bulkier, and more difficult to transport it will be. Smaller shields can be lighter and easier to sneak into a protest area. Many people have been carrying smaller shields with them while playing other roles besides maintaining the shield wall. Having even just a little bit of protection has saved people from serious injury and provided the confidence to hold territory they might not otherwise have been able to.

A common Portland shield design involves cutting a plastic barrel vertically into three or four curved rectangles, leaving the circles from the top and bottom of the barrel for making smaller shields.
To form a shield wall, it is best to be able to line up shields so that they overlap slightly, as even slight breaks in the wall can present a vulnerability. Consequently, plywood may be preferable to barrels for that particular application."

-Tools and Tactics in the Portland Protests

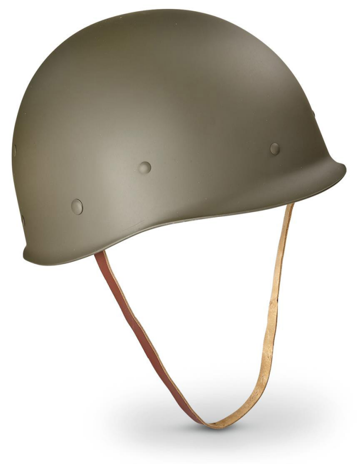
Metal Reinforced Banner Design

Important: The visual in Diagram II. shows just two segments of reinforced banner, though we recommend reinforced banners with three segments, as they provide more coverage. Each segment is held by one person; as you can see in Diagram II., each has two handles, one for the left hand and one for the right. Each piece is connected by zip ties all along their connecting edges so that they can fold in on each other. We recommend making banners with three pieces so that they can be held by three people.

Some climbing helmets rely on suspension alone, while others use a hybrid system that incorporates crushable foam. As far as suspension helmets go, climbing helmets seem like a good choice.

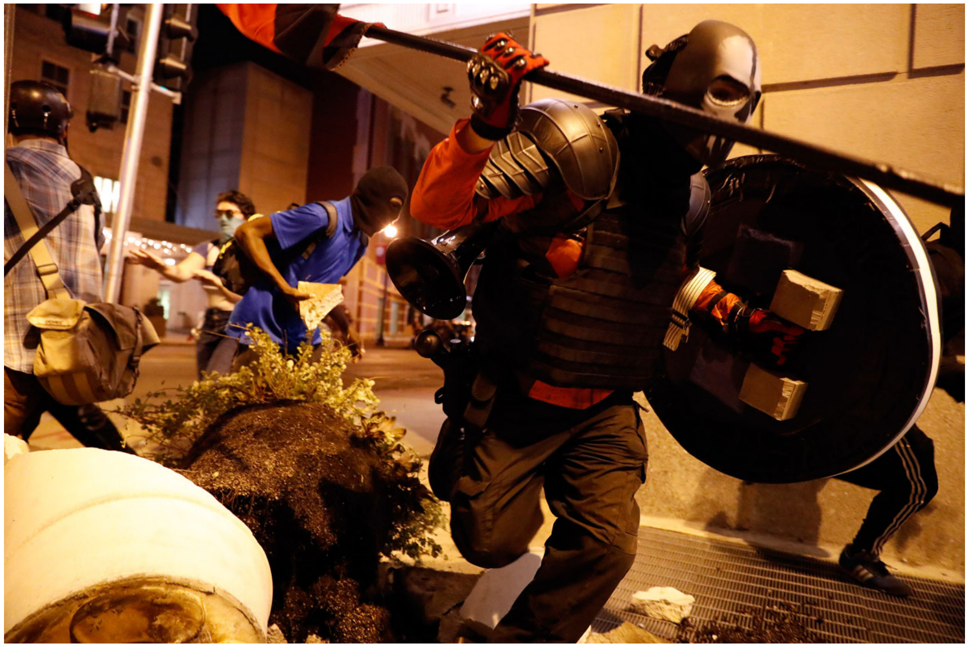
Antique Military Helmets

Unfortunately, we cannot recommend the medieval helmet or a steel 20th century war helmet for protests, though some of us might wear ours anyway. Most medieval helmets and early modern military helmets use a leather suspension system, called a helmet liner, to hold the hard shell away from the head.



An M1 helmet—the helmet of the US military from the Second World War until 1985.

The Society for Creative Anachronism (SCA), who fight with steel swords and armor for sport, requires steel helmets to be at least 16 gauge or thicker steel; many SCA fighters prefer 14 gauge steel. Anything thinner might be considered “decorative” only. We have not tested steel with impact munitions, and the deformation of a helmet could be very dangerous to the wearer if, you know, the helmet crushes your head. Many re-enactment fighters, rather than using traditional suspension systems, build foam liners from ½” or thicker closed-cell foam (yoga mat foam is thought of highly for this). Others use modern military helmet padding. To the best of our knowledge, a human arm with a steel bar (like a sword) delivers substantially less force than the more powerful impact munitions used by police, so we cannot recommend medieval helmets in good conscience until we’ve tested them properly.



A demonstrator expressing opposition to the courts extending de facto impunity to murderer and former St. Louis police officer Jason Stockley on September 17, 2017, in St. Louis.

Some people wear surplus early modern helmets, which are plentiful. Most of these are not rated against bullets, but were designed to protect soldiers from accidents and shrapnel. A few have a Kevlar liner and approach a ballistic-rated degree of protection. We're curious what would happen if one were to replace the suspension liner with modern military padding and a chinstrap harness, but we have not spoken with anyone who has tried this yet.

Crash Helmets

There are more types of crash helmets than we can easily cover here. Crash helmets tend to be the most readily available helmets and they usually look "civilian" and unthreatening. Someone in a bicycle helmet can look like they were on their way home from work when they were swept up into a crowd. Also, some crash helmets can be concealed under a hood. For these reasons, as well as their relatively cheap prices, we recommend them—especially skateboard and snowboarding helmets.

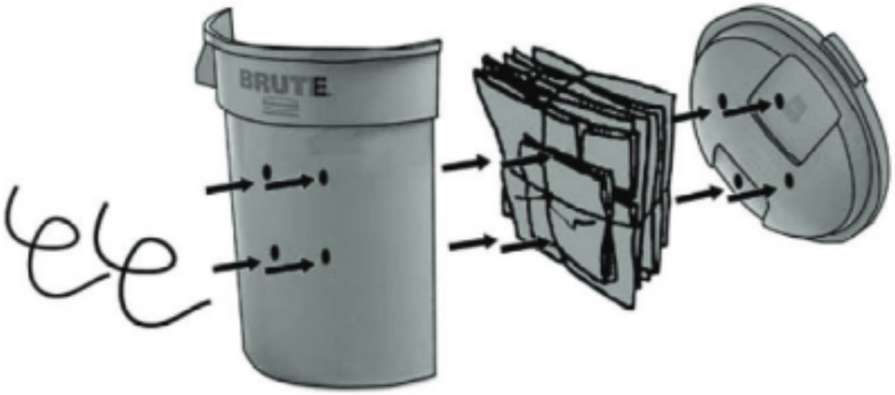
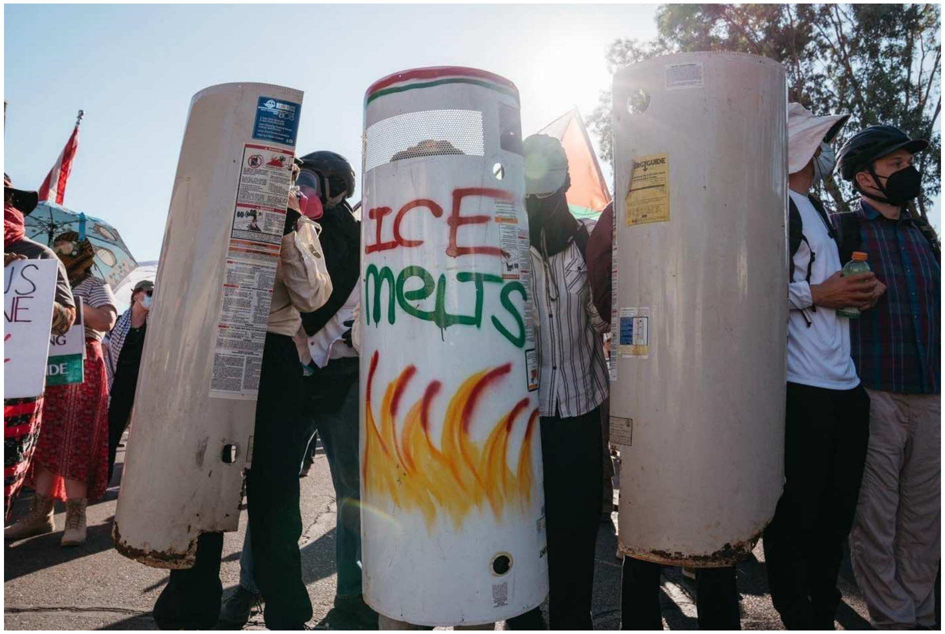


Diagram I.

In *Diagram I.*, you can see another group's design for a shield that uses some cardboard for cushioning, cut up pieces of a trash can, and rope, hose, or bike tube. We are a little confused over the function of the second layer of plastic (the trash can lid), and would recommend using the cardboard as the cushion that your arm rests on—otherwise, a strong impact such as a baton could break the plastic, severely injuring your hand. Plastic is generally not a forgiving surface for you to be directly touching during any kind of impact.



Improvised shields in a demonstration against US Immigrations and Customs Enforcement assaults in June 2025.

What reinforced banners bring to the table is their size and their physical and organizational power. Because these banners are held by several people, they are harder to tear away, offering more protection. A police officer cannot simply tackle a person on the other side of a reinforced banner. For the same reasons, it is harder for opponents to withstand pushes from these tools. Reinforced banners can stop not just one but several officers from entering a crowd. In this way, they can enable a crowd to assert a balance of power with the police, establishing distinct areas of control.

In our city, we have seen more than a dozen comrades pushing forward a single reinforced banner as a dozen cops push against the other side,[13] in a contest of strength as the police tried to attack the crowd while paint, rocks, and fireworks rained upon them from behind the banner. Organizationally, seeing several people holding a banner seems to encourage crowd unity around them, creating a focal point for defense and action. This has the benefit of impeding police from using intimidation to break up a group, especially when they simply do not have the numbers to do so by other means.

Shields

In the end, the choice between shields and reinforced banners depends on whether you aim to employ a symmetrical or asymmetrical approach to conflict. Is your goal to engage in a direct contest of strength in order to gain or maintain terrain, or is it more important to prioritize agility and ability to separate from a crowd as needed? How long do you need to be able to sustain frontal clashes after losing the element of surprise? Reinforced banners can offer more protection from many police actions, but defending a fixed position can quickly open up other vulnerabilities. The answer to these questions likely depends on the nature and location of the action. If it is a general riot, the shield may be better, but if it is a focused offensive or an effort to defend a large crowd, a reinforced banner may be better.

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[13] For an example of this, see the cover of the first issue of *Rolling Thunder.*

Crash helmets, unlike suspension helmets or padded helmets, are less likely to be effective when purchased used. Fortunately, they tend to be very cheap new.

A bike helmet.

Bicycle Helmets

Bicycle helmets are probably the most inconspicuous helmets you can wear apart from something completely concealed like a bump cap. They’re also dirt cheap. Those are their main two advantages. The disadvantage is that bicycle helmets are substantially less penetration-resistant than many other crash helmets, as the plastic shell is basically an afterthought. The plastic shell is so thin, in fact, that some of us have seen police batons shatter them entirely, sending shards flying that have cut people.

In the United States, bicycle helmets—unlike skate helmets and other sport helmets —are required to meet certifications using the CPSC standard. However, they are only required to survive a single impact. In short, they’re designed to be disposable.

One study we read indicated that $10-20 bicycle helmets meet the certification standards (on the basis of various impact tests) roughly as well as $100-200 helmets.

We’ve seen an FN303 pellet (an impact .68” airgun pellet) embedded deep in the foam of a bike helmet, implying that it sufficed to stop the pellet.

Skate and Snowboard Helmets

Skate helmets cover more of the head than bike helmets, since they aren’t designed to be aerodynamic. Snowboard helmets are functionally the same as skate helmets; the chief difference is simply that they lack ventilation holes entirely, as they are designed to retain heat.

Skate helmets, unlike bicycle helmets, require no certification to be sold as such. Some companies apparently certify only certain sizes of the helmet, because they use different amounts of padding in different sizes. If they *are* certified, these helmets are certified to ASTM F1492 standards, meeting a higher standard than bicycle helmets in that they are rated to survive multiple impacts.

Some snowboarding helmets come in with a built-in comms systems, which could be useful to a protestor.

Skate helmets are one of the best cheap options for helmets. Be careful when buying skateboard helmets online, as the listings are sometimes for children's helmets in children's sizes.

Aaron Cantu was wearing a helmet of this kind when a police officer in Portland, Oregon intentionally fired an aerial flash-bang grenade directly at his head in 2018. Police are supposed to fire that kind of flash-bang into the air, to explode above the crowd—though in practice, they routinely aim them at our heads. The grenade penetrated Aaron's helmet and became lodged in it, shattering his skull. He survived—and credits the helmet with saving his life.

Skateboard and snowboard helmets

Motorcycle Helmets

Motorcycle helmets are designed to survive much higher levels of impact than other crash helmets. They're also more expensive. If you're buying something specifically for protests, they aren't necessarily the best choice. If you have one around, however, it's a helmet—a very good helmet. And if you ride a motorcycle or scooter to the demonstration, then you already have a helmet with you.

Full-face motorcycle and motocross helmets offer much better protection for a motorcycle accident, but this does not translate well to protest situations. They're cumbersome, they limit visibility, and they make it much more difficult to wear respirators or ballistic goggles.

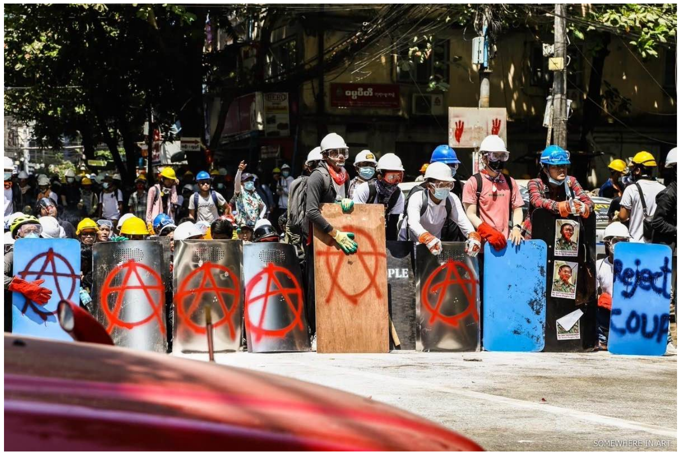
Three-quarter (open-faced) helmets and half helmets are much more useful for protest situations, as they are more compatible with masks and goggles. Half helmets are substantially cheaper than other styles.

Shields and Reinforced Banners

You can use shields and reinforced banners to accomplish many different things:

- Protect yourself from rubber bullets, water cannons, batons, pepper spray, and being tackled or punched.
- Protect others who move behind the shield, whether they are engaging in activities such as throwing rocks and using paint-filled fire extinguishers or are simply in need of protection or assistance.
- Conceal activity that is going on behind the shield, including changing clothes or preparing tools.
- Act as a solid wall for pushing back opponents without engaging in clumsy and risky grappling.
- Serve as an intimidation tactic, instilling fear or uncertainty in adversaries, especially when the participants have many shields.
- Function as a decoy, becoming the focal point of police attention, despite not being a high-risk tool, enabling others to act while police are distracted.
- Similarly, rather than arresting people, police often focus on grabbing shields or banners. It is better for police leave with their arms full of duct tape and plastic than dragging off a comrade.

Compared to reinforced banners, shields have the benefits of being lighter and easier to make; they allow whoever is holding them more agility and spontaneity. When you have a shield, you can easily ditch it, run around, and make your own decisions. In a context in which agility is needed, shields may be best.



A shield wall in Myanmar.

A Demonstrator’s Guide to Reinforced Banners

And How to Use Them

This guide explores how to construct reinforced banners that can function as a mobile shield wall during demonstrations.

To be clear, we do not encourage anyone to engage in illegal activity with banners or shields. We only offer these designs to satisfy the curiosity of historians.

Refining a Defensive Tool

In our city, anarchists have spent several months improving a design for reinforced banners. We use these banners to protect ourselves from police violence. Often, in large actions in which dozens of people arrive with a plan, these banners play a role in both offensive and defensive activities.

Initially, we used a wooden frame for our banners. This involved light but solid pieces of wood, metal handles for a firm grip, and a tarp across a wooden frame. The frame was solid and a team of three could carry it. However, even though the wood was light and we made several experiments with different kinds of lighter and lighter wood, the design was still too heavy. In addition, a comrade from another country observed that the banner attracted too much attention going in and out of actions. Where he came from, you could fold banners. Another issue was that it was not especially difficult for a kick or police baton to pierce the tarp that covered the frame.

Our new design, which we have tested with satisfactory results, has four core advantages: it is 1) light 2) cheap 3) foldable 4) dense.

We prepared this guide after comrades from many different cities responded enthusiastically to our new design.

When purchasing motorcycle helmets, our friends at Indigenous Anarchist Federation-Federación Anarquista Indígena (IAC-FAI) remind us in their own article about protest gear that

> “DOT certification is not worth the ink its printed with since it is a ‘self-certified’ safety standard. For real safety, especially ballistic protection from the visor, be sure to get a helmet that meets ECE or Snell safety standards.”

Full face, 3/4, and half motorcycle helmets

An equestrian helmet.

Equestrian Helmets

Equestrian helmets are similar to skate helmets, but those that are certified to the ASTM standard F1163 are also tested against the sharp impact of a horse hoof. This is good for protestors.

Padded Helmets

Suspension and crash helmets are just-in-case helmets, but padded helmets are worn by people who expect to be hit in the head: athletes, soldiers, cops, and, increasingly, well-dressed demonstrators.

Let’s separate this category into two sub-categories: sports helmets and tactical helmets.

Sports Helmets

More than any other category of helmet, sports helmets are designed specifically to protect against blunt impact; an incredible amount of engineering has been invested in this lately. Sports helmets are also the most readily available helmets on the secondhand market. In some cases, you’ll have to remove the facemask so it doesn’t interfere with your ability to wear masks and goggles—and so it won’t offer an opponent an easy opportunity to grab hold of your face and control your head. Other sports helmets are designed in such a way that they are not compatible with gas masks and goggles at all.

Make sure the padding of your sports helmet is in good shape.

Hockey Helmets

Hockey helmets are designed to protect against fast moving hockey pucks—which are a lot like the impact weapons used by police. Half-helmets are preferable, without a chin bar or face mask. Hockey and lacrosse helmets are two common and effective protest helmets.

Lacrosse Helmets

Lacrosse helmets are a lot like hockey helmets, but they are lighter and offer good ventilation as well as good peripheral vision. Although you’ll probably have to remove the facemask and chin bar, lacrosse helmets are a solid choice.

Whitewater Helmets

According to whitewater rafters we’ve spoken to, whitewater helmets are similar to other padded sports helmets, rather than to crash helmets. Although we lack direct experience with them, it appears they would serve well for protests.

Football Helmets

Football helmets are specifically designed to protect the head from repeated blunt impact. Some football helmets employ a two-shell system, utilizing what one company calls a “shock bonnet” in which plastic shock absorbers between the

But it was shut down, our message against the war and business as usual was all over the news, and the action clearly affected the morning commute to work. In addition, we gained useful experience for our future endeavors.

A barricade in Lebanon.

Further Reading

- “Lock-Ons, Devices, Tree-Sits, and More” by the Direct Action Movement

In the planning for the action, we secured two junker cars to help stop traffic from reaching the bridge. The two cars, one of which was a minivan, were also loaded up with big scraps of wood and metal (including a bed frame), chains, and locks that would be used to form barricades that would fill in the areas around the cars. In the vicinity of the site of the action, there were also road signs and other construction-related barricades that could have pulled into the street. The plan was for an affinity group in the march to open up the cars and pull out all the materials to set up the barricades—but it happened that the folks who were going to do this were tied up on the other side of the bridge by a heavy police presence. By the time they got near the cars, the police had blocked them off and made them inaccessible.

In addition to getting drivers for the vehicles and people to assist in building the blockades, we secured volunteers for several other key roles. We had a loop of communications people within the bike ride, the march, and on the bridge as scouts, as well as folks on site in advance to check for any early police presence. Cell phones were used to insure the simultaneous arrival of both the march and the Critical Mass ride. We also had a couple of people set to lead the various risk levels of the march: those who couldn't risk arrest followed one color flag to a support rally across the street, while those who could engage in blocking the street followed another. While our ultimate goal was for no one to be arrested, we wanted to make sure that those for whom arrest was not an option were able to participate as well, and to feel comfortable participating. Action medics and legal observers accompanied the march, and the variety of roles allowed for those who could not engage directly in the blockades to play an equally active and important part.

This plan was largely organized in public, so the police presence awaiting us was unavoidable. Only a handful knew the full details of where we would end up, but unfortunately that must have been leaked. Had we done a better job of keeping the target a secret, we might have had more time to get things in place. On the other hand, the bridge we picked is one of the main entrances to the city, so it might have had a large police presence regardless.

However, the bridge was completely shut down for about 30 minutes, and partially shut down and made into a spectacle for hours after that. It was a nasty day, cold and pouring rain. The action didn't entirely go as planned—the idea was to shut down both ends of the bridge and have a street party against the war in the middle. Instead, the police cleared all of us from the bridge pretty quickly.

inner and outer shell absorb the impact. Apparently, this dramatically improves the protection these helmets offer against concussions. However, it doesn't appear that this technology has been widely adopted yet.

Batting Helmets

Worn in baseball, batting helmets are cheap and strong. Traditional models are designed to survive baseball impacts of 70 mph, while newer models are rated up to 90 or 100 mph. The official helmet of Major League Baseball—the Rawlings S100 Pro Comp—uses this newer design, though some players complain it offers less mobility than the older models. We've yet to test how batting helmets fit with respirators—and many don't use any kind of chinstrap, so they can easily fall off or be removed in a scuffle.

A variety of sports helmets.

Tactical helmets

Tactical helmets are designed for combat. That's why cops use them: police constitute an occupying military force. Tactical helmets are intended to protect soldiers and other professional fighters from the hazards of their job, such as bullets and shrapnel. Many of them are also designed to stick gadgets onto. Gadgets are useful: in particular, activists might be interested in being able to mount ear protection or visors. Journalists might be interested in the ability to attach cameras, though we cannot in good conscience recommend that anyone film protests in such a way as might incriminate fellow protestors.

A note on buying tactical helmets securely—a lot of tactical gear manufacturers are explicitly politically opposed to various social movements, and many donate money to police organizations. While sometimes it's necessary to let capitalists sell us the rope to hang them, it's worth considering where your money is going

—and what information you are giving to a manufacturer when you purchase from them. Consider shipping your purchase to a post office box at the very least.

Also, it is illegal in the US for those convicted of violent felonies to own body armor designed to protect against bullets. Some exceptions can be found through workplace requirements. This law likely only applies to ballistic helmets.

Tactical helmets can be distinguished by their ballistic rating, their style, and whether or not they are designed to carry gear. They are available in a wide range of prices and combinations of features. For that reason, we'll discuss the different categories of features that can be mixed and matched, rather than mutually exclusive types of tactical helmets.

Ballistics

There are four ratings of tactical helmets available. At the lowest end are airsoft helmets, which are often less than $50. These are generally not certified at all; functionally, they are just plastic replicas of higher-quality helmets. The next step up is bump helmets (which are distinct from bump caps). Bump helmets are tactical helmets that are not rated to protect against gunfire, though they are often well-made and certified to decent safety helmet standards. They are half the weight of ballistic helmets and substantially cheaper. In the military, they are usually only used by people who want the ability to hold gear like night vision goggles without the weight of a ballistic helmet. First responder helmets are often bump helmets in bright colors.

Then there are ballistic helmets. Nearly all military ballistic helmets are rated to NIJ IIIA—which is to say, they are rated to protect against handguns but not rifles. Finally, there are some helmets that claim to protect from rifle rounds. Most of these helmets only protect from certain rifle rounds at long distance. Others, however, can use a special insert to increase the level of protection they offer against rifles. This also increases a helmet's weight. Ballistic helmets are generally made of aramid fibers like Kevlar.

The best kind of helmet available to a demonstrator for confronting almost any impact threat model is a ballistic tactical helmet. However, the cheapest ones start new at $200, and most well-reviewed models are $500 or more. If bump helmets, or even airsoft helmets, are able to withstand less lethal munitions without penetration, then with impact padding, they are the next best thing for a fraction of the price. However, we have not tested this ourselves.

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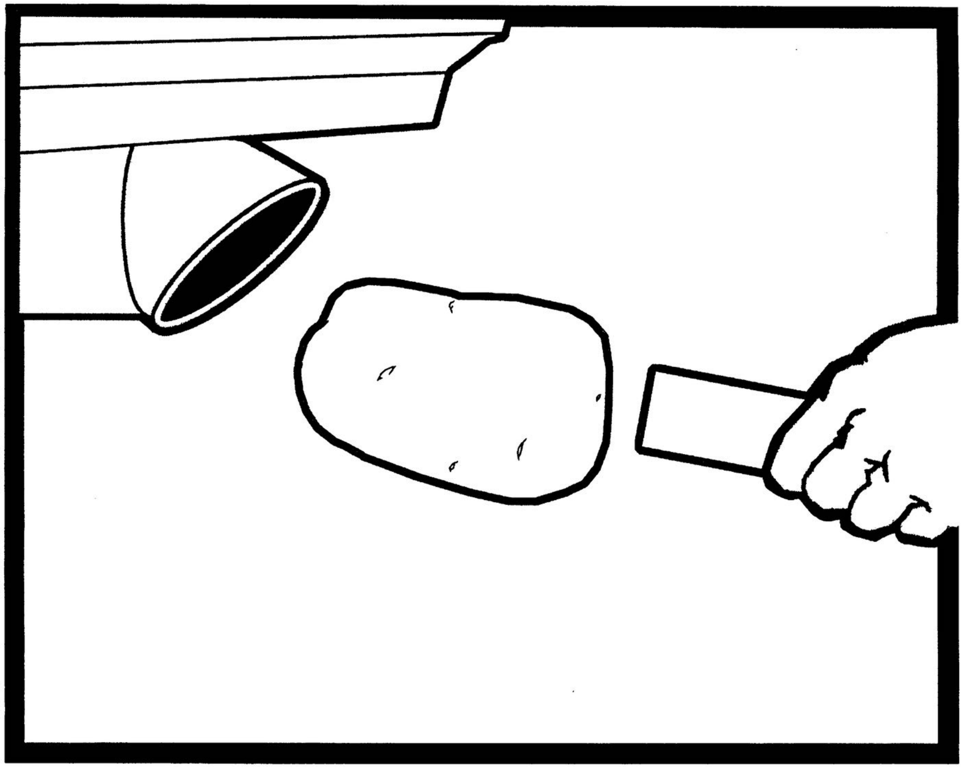
affinity groups, separate from the march and bike ride, brought banners to the bridge and hung them up around the main intersections while still other groups handed out fliers detailing our reasons for shutting down the bridge and explaining our opposition to the war.

Two drivers sat in junker cars near the bridge on the Virginia and DC sides, waiting for the word that the march and bike ride were nearing so they could get into place. When they learned that the march was coming, both cars drove out and stopped and parked at the DC side of the bridge. Originally, there was to be a car on each side, but the police presence on the Virginia side of the bridge, combined with the landscape of the area, made it seem very unlikely that a driver who had to abandon a car there would be able to make a successful getaway.

The drivers parked their cars at an angle to take up as many lanes as possible, hopped out, moved to remove the license plates that had enabled them to drive around safely, and ran like hell to get away. Unfortunately, there were hundreds of cops on the DC side of the bridge, some of whom immediately began chasing one of the drivers. They eventually caught up to him, punched him a couple of times, and threw him in the back of a paddy wagon. They also picked up one of the scouts who was doing communications on the bridge, mistaking her for the guy who had been driving the other car. In custody, she heard over the radio that the cops had realized their mistake. They suddenly opened the doors to the police van, saying, “Get out, we don't want to deal with you right now”—and let both people go!

Three people were arrested on the Virginia side of the bridge. We had a bail fund and legal support team ready to go to get them out. They were out in a couple of hours, and thanks to the coordination of the National Lawyers Guild and DC's local direct action legal collective, a local lawyer took the cases for free.

Let's back up and talk about how we put this together. This action posed several organizing challenges because we did not know when the war would start. Because of that, we took steps to ensure that we had all the needed action roles sorted out weeks in advance. We even had understudies for some of the roles, in case certain people happened to be unavailable the day we needed to carry out the action.



You can disable cars and trucks quickly and easily by using a stick to push a large raw potato into the exhaust pipe and out of sight. This technique can baffle even skilled mechanics. Once the potato is removed the automobile will work again.

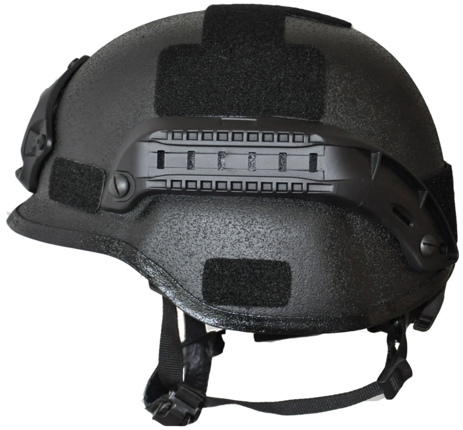
After the train crossed the river into Virginia, the various color-coded groups were instructed to exit at the Roslyn stop, a short walk from the Key Bridge. The Key Bridge is a main artery between DC and Virginia; it serves as the entrance to Georgetown, one of Washington's wealthiest and most upscale shopping districts and also full of targets which could be related to the war. In addition, the Metro stop was only a few short blocks from the offices of the Boeing Corporation, another possible target with obvious connections to the war.

As the march headed toward the Key Bridge on the Virginia side, the Critical Mass ride was weaving its way through the DC streets to meet the march on the DC side of the bridge. We hoped that this would enable us to block the bridge effectively from both sides, bringing business as usual to a halt, focusing attention on the war that had begun only hours before. To add to the display of resistance and accompany our actions with precise and pointed messaging, other

Styles

We will focus on US models of ballistic helmet, because these are what are most readily available here and most manufacturers copy them. There are numerous styles for numerous purposes, but the most common include:

PAGST helmets are a style of ballistic helmet that has been largely phased out since 2001. Soldiers complained that the suspension system and pads were inadequate and that the strap worked poorly. The brow also limited visibility, and the nape protection extends low enough to interfere with shooting from a prone position. It would absolutely be worth wearing a PAGST helmet if you find one cheap, but if you're shelling out real money to buy a ballistic helmet, don't settle for a PAGST helmet.



MICH helmet with side rails and a shroud.

MICH/ACH helmets replaced the PAGST model. The ACH is a more modern version of the MICH, but the helmets are very similar. Compared with the PAGST, it has a better chinstrap and relies on padding rather than suspension. It's considered to offer superior protection against blunt impact. Now **ECH** helmets are replacing the ACH; they have a very similar design, but they are made of a lighter-weight material that some people consider slightly weaker, ballistically. This style of helmet has "ear bumps" that permit the user to wear headphones inside it, although the fit is not always perfect.

FAST/ATE/High Cut helmets are built similarly to MICH/ACH helmets but are cut above the ear (ATE) instead of having ear bumps. These weigh less, protect less, and allow the user to wear rail-mounted ear protection. Given the choice, this might be the style best suited to protest situations, particularly if you might need to wear ear protection. A "bump" model, rather than a ballistic model, weighs half as much and provides as much impact resistance, though less protection from bullets. Older models of this style of helmet, such as you might find on the surplus market, are sometimes called CVC helmets.

Side Rails and Shroud

Some ballistic helmets (sometimes described as “shell only”) are plain helmets without mounting systems, but most tactical helmets are distinguished by the various mounting options built into them—usually, side rails and a shroud. Surplus helmets, particularly older helmets, are much cheaper when they don’t come with rails and a shroud. These can be attached aftermarket, but it’s a bit of an undertaking.

The “shroud” is a rectangle on the forehead of the helmet that is designed to mount night vision goggles. In the civilian market, most people use this spot to mount GoPro cameras. The shroud is a fairly universal mounting system, although some cheaper helmets are poorly made and may not lock as tightly with accessories. The side rails usually run above and sometimes behind the ear and are used to mount other devices. They can hold visors, ear protection/comms devices, flashlights, cameras, or anything else you desire. Just as with the rails on rifles, not all helmets use the same standards for the side rails; there’s an entire industry of people selling adaptors to translate between all the different rail standards. If you go for rails, make sure your accessories fit your rails.

The primary reason you might want side rails for a protest situation would be to mount noise-gated earmuffs. These headphones muffle loud sounds (such as gunshots, flash-bangs, LRADs, fireworks, and liberals with megaphones) but amplify quiet sounds.

Still, most helmets (not just ATE helmets) are designed to accommodate earmuffs like those underneath the helmet—which is less comfortable, but can be substantially cheaper.

If you wear anything heavy on the front of a tactical helmet, such as night vision goggles, you might need to wear something as a counterweight on the back. Soldiers sometimes store extra batteries there for this purpose.

Padding

The strongest shell in the world won’t protect your head from blunt impact without good padding. Many helmets, including some military-issue helmets, come with inadequate padding. Padding serves two purposes: impact resistance and establishing a tight yet comfortable fit. Both are important. To our

Account

In winter 2003, before the second Gulf War began, people were carrying out direct action all across the globe in an attempt to stop the war before it started and to connect the impending invasion of Iraq to the larger war that capitalism wages everywhere. Direct actions in New York City and San Francisco had shut down the Holland Tunnel and Financial District, respectively, and other protests were also making headlines.

Anarchists and other direct action enthusiasts in Washington, DC were organizing regular actions while trying to prepare a plan to carry out as soon as the bombs started falling on Iraq. Our theme was “When the War Starts, America Stops.” We put out fliers calling for an “Emergency Response Direct Action—the Morning After War on Iraq Starts.” People who wanted to participate on bikes could show up for a “Race Against War” in Dupont circle; at the same time, people who wanted to participate on foot would head to the other side of town for a “March of Resistance” at the Eastern Market Metro stop. We also put out a call for groups to carry out actions on their own to further disrupt business as usual throughout the city.

We had organized a lot of direct actions in DC over the preceding few years. The state was usually aware when there’s going to be a lot of protest activity, and the police presence would be really intense. Given this atmosphere, just meeting up for a protest without being shut down from the start could be really difficult. To account for this, we came up with a complicated plan like nothing we’d done before. We would use the city’s public transportation system and the fact that Washington, DC is wedged between two different states to our advantage.

The march started in southeast DC, near the US Capitol. But instead of the march taking to the streets of that area, a typical setting for DC protests, the crowd was led down into the subway station. We handed out different colored slips of paper corresponding to the colors of the flags participants were to follow onto different cars of the same subway train. The people leading the groups into the different cars were responsible for making sure no one got separated from the protest and that everyone made it to the correct stop. On the train, people sang, chanted, had conversations with commuters, and passed out fliers about why we were there. A lot of folks in DC ride the train to work at that hour, so it was a good opportunity to take our message directly to many people.

abandoned as a blockade at the conclusion of a bicycle ride. It is possible to set off the automatic arms of railroad crossings by using jumper cables to complete the circuit between little trigger wires on the tracks. Individuals dressed as construction workers can put out traffic cones and barrels and wave down cars; for that matter, giving drivers a spectacle of any kind to stare at will slow them down. A banner drop over a busy highway can slow traffic significantly, potentially creating a traffic jam which might itself constitute a blockade of sorts—nothing obstructs cars like more cars!

Speaking of cars, you can drive old junker cars into place and disable them; better yet if you managed to buy them with cash from people who won’t remember anything useful about you if the authorities come asking. They can be loaded with barricading material, ready to be deployed wherever they end up; people can even lock down to them.[12]

Once traffic is slowed or stopped, you can stretch cables or fencing across highways and affix it to telephone poles, light posts, or guardrails.

Don’t forget that quick-drying concrete can effectively seal many gates and other means of access. Mixing nuts and bolts or other material into it can make it more durable.

For a humorous effect in a low-risk environment, you could brick up the door of an office or business. Pick a quiet night, so the mortar will have enough time to dry.

CEDA EL PASO
POLICIA

Ecuador. A supposedly unstoppable force meets an actually immovable object. “Let your tears freeze to stones we can hurl from catapults.”

When blocking off both ends of a street or bridge, make sure you leave an exit. You don’t want to let traffic in, but you also don’t want to trap civilians—or yourself. Always make sure that you are not blocking access to a hospital or similar establishment.

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[12] When puncturing tires, aim for the sidewall; if you want to be sure the spare won’t help, you can puncture at least two of them. You can also use a pocket-size valve stem remover to disable tires without puncturing them.

knowledge, there is no single foam that provides both. Good pads are multilayered.

Pads are generally foam encased in fabric. Sometimes there is plastic between the fabric and the foam to keep sweat from soaking the pads—this is likely an important feature for chemical weapon exposure as well. Some pads incorporate both types of foam (impact and comfort) in multiple layers within a single pad, while other padding systems use separate pads, which makes the helmet more customizable but also demands more work. In a multiple-layer pad system, it’s important to use both layers everywhere there is foam.

Pads are largely interchangeable between all types of tactical helmets, as all use hook-and-loop attachments and are designed to be customized by the wearer to fit their unique head shape.

Good pads can be found reasonably cheap (approximately $40). Any reputable manufacturer should be proud to announce their impact resistance certifications.

Surplus

You can purchase surplus helmets on ebay.com or via a variety of surplus sites. A used helmet is better than no helmet, but the ballistic fibers of helmets break down from wear and tear as well as exposure to sunlight, and you have no way to ascertain where the helmet has been. Still, surplus helmets are substantially cheaper. Some models in some sizes can be found for as little as $50, although prices closer to $200 are the norm.

Chinese Imports

Unfortunately, forums that discuss the efficacy of various ballistic helmets tend to be dominated by US nationalists and gear snobs, which makes it hard to identify honest reviews of cheap equipment, especially foreign-made options. Yet the cheapest source for new, ballistic-rated helmets (especially helmets with all the bells and whistles) is China. Many manufacturers claim that they offer US quality at China prices, and we’ve found that “cheap” Chinese “knockoffs” often perform similarly to American models. We don’t currently have the resources to test these claims about Chinese ballistic helmets.

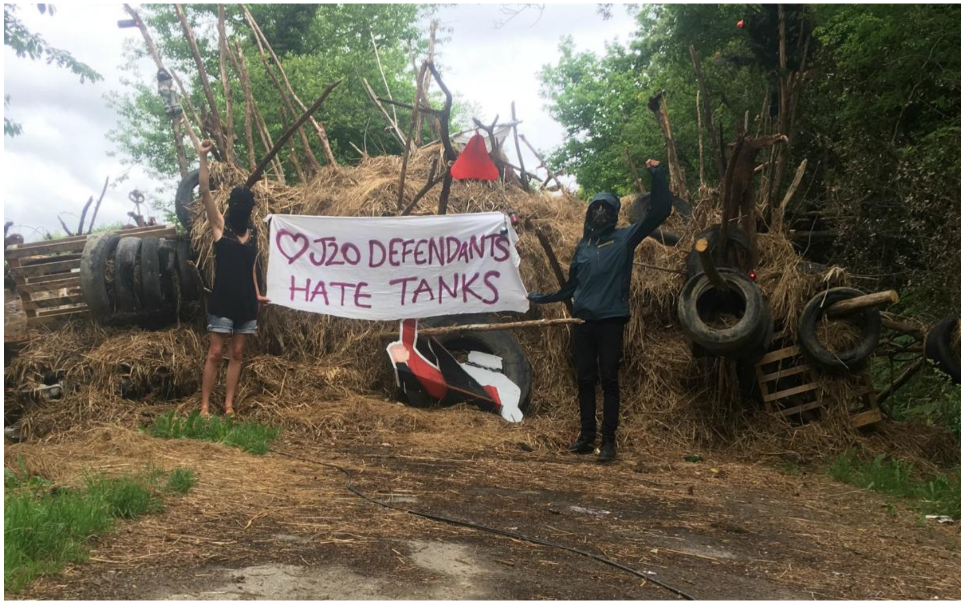
It’s likely that helmets that are ballistically rated will stop handgun rounds, as they claim. The primary argument we’ve seen online is about whether the shell will deform upon impact enough to injure or kill the person wearing the helmet. We haven’t been able to reliably source that information yet. In any case, it’s never a good idea to get shot in the head with live ammunition. Even if the bullet does not penetrate and the shell doesn’t deform, the blunt force alone can be enough to injure or kill.

At least one predominant ballistic helmet manufacturer, Hard-Headed Veterans, has their helmets manufactured in China.

> “My friend lost an eye when he was in high school. A cop shot him with a rubber bullet. A couple years later, we were participating in a new round of protests against police violence, and people were getting seriously injured at every demonstration. We discussed it and concluded that, sure, maybe the police would target us more if we protected ourselves as individuals, but if we all protect ourselves, we would all be better off. My friend brought a shopping cart full of helmets to the next demonstration and made a speech about how important it was for everyone to wear one.”
>
> “Since then, every couple demonstrations, someone brings a bunch of helmets to give out—all different sizes, to provide for everyone, since, for instance, I have to wear a child’s helmet for it to fit right. That helped to normalize wearing them.”

Other Blockading Methods

There are many other ways to create blockades. The most traditional is to build a barricade. An individual who desires to lock herself to something or someone can do so by putting a bicycle U-lock around her neck, though this requires the same support infrastructure that a traditional lockdown does. Extremely experienced and prepared groups can build tripods and suspend individuals from them, taking the civil disobedience of lockdowns to another level. Dirt roads can be blockaded by digging ditches across them; fencing, metal or wood poles, cables supporting such poles, or other materials can be planted in them, too.[11] If police become anxious or confused enough, they may block off an area for you.



A barricade at la ZAD in France.

When blockading a busy thoroughfare, it is important to slow traffic to a safe speed first. A bicycling group could slow to a stop, becoming a blockade in itself and offering the opportunity for more permanent blockading to take place. Old bicycles, perhaps outfitted with extra metal, could be locked together and

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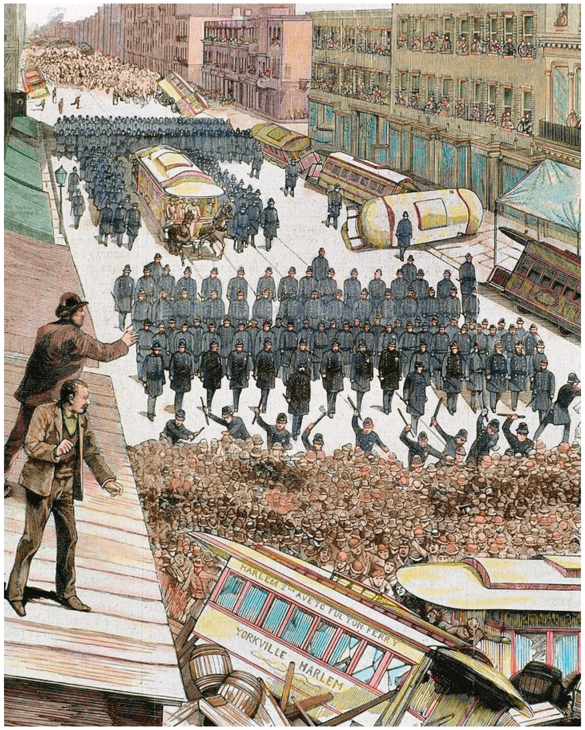
[11] You can heat rocks in a fire and use them to blockade a road or thoroughfare. Use porous rocks, as nonporous rocks will simply explode, and be sure to identify them for everyone’s safety. For the sake of convenience, you could set the fire, rocks within it, at the location to be blockaded, so as not to have to work out how to move them.

> In both the lockdowns in which I participated, the police told us that because we used the lockboxes we would be charged with an additional PIC offense, but of course, as police are wont to do, they were lying. PVC pipe, chain, and carabineers are not implements of crime, no matter how you slice it.

In multiple cases in the Stop Cop City movement in Atlanta in 2024, demonstrators who locked down were repeatedly charged with misdemeanor trespassing, but when two activists climbed a crane at a Brasfield & Gorrie construction site and locked themselves in place, a prosecutor charged them with “False Imprisonment,” a felony kidnapping charge. Absurdly, the police claimed that the crane operator—who was on the ground the entire time—was “unable to leave” due to the activists suspended 250 feet above him.



Barricades and blockades have a storied history in labor struggles in the United States. In this illustration, police officers face off with striking streetcar employees in New York City on March 4, 1886.

In any case, you should have a group ready to provide immediate legal support.

Committing to a lockdown is a serious matter. You must be prepared for the ordeal of interacting with infuriated police officers over a protracted period of time, while being unable to move freely. This will be followed by the further ordeal of being arrested and spending time in jail. Embark on a lockdown in a state of inner peace and resolve, properly fed and hydrated, prepared to weather storms of danger and drama—and if you think you might be there for a long time, wear an adult diaper!

A Demonstrator’s Guide to Gas Masks and Goggles

Everything You Need to Know to Protect Your Eyes and Lungs from Gas and Projectiles

One of the basic ways that police maintain violent control of our society is by interfering with our ability to breathe—and sometimes with our ability to see. Nowadays, regardless of whether you employ confrontational tactics, you could be exposed to tear gas or hit by a rubber bullet just by being is in the vicinity of a protest. By taking the proper precautions, we can mitigate the risks while continuing to show up for each other. This guide explores a wide range of options for protecting your eyes and lungs from chemical agents and projectiles, detailing the advantages and disadvantages of each, so you can pick out what’s best for you.

Executive Summary

The best respirator is the one you have access to. Respirators are good at what they do—filtering air—and most of them will serve you well enough in a pinch. If you don’t have time to read the entire text and you need to get some gear in a hurry, here are some options:

The No-Compromise Expensive Option ($260-340)

If you want a new high-quality full-face mask that will work in the apocalypse, the MIRA CM-6M costs $220-240. The 7M is similar, but has a more “tactical” look. You can purchase this mask with two MIRA-brand CBRN cartridges for $50 each; otherwise, filters will cost $70 apiece.

This is all you need. If you don't want to use $100 worth of filters at a single demonstration, however, leave the CBRNs in their packaging at home (or skip buying them entirely) and get two expired-but-unopened CBRN filters for roughly $20 each via ebay.com. These should work for tear gas and pepper spray, but not for apocalypse-level threats. Each filter should work for approximately eight solid hours of full chemical exposure, which could mean 30-40 hours in the street during demonstrations that involve a lot of tear gas. You should change the filter as soon as you begin to smell gas leaking through.

MIRA CM-6M gas mask.

If you wear glasses, this mask is compatible with the 3M Safety 6878 Spectacle Kit designed for their 6800 mask. You will need to get prescription lenses for that.

The Cheaper Full-Face Protection Option ($40-150)

Civilian style full-face respirators such as the 3M brand 6800 ($150 with filters, using the same ones from the modular option below) offer protection for a much cheaper price. In our impact testing, we've also found that the JJKK and HAOX brand Chinese imports ($40, with filters) serve just as well to protect your eyes and offer an adequate seal against gas.

An example of a cheap mask [HAOX brand on Amazon].

The Cheaper and Modular Option ($75)

If you want an affordable option that offers the best combination of ballistic resistance and chemical weapons protection, get a 3M half-mask respirator from the 6000 series for $25. The 6100 is the small, the 6200 is the medium, and the 6300 is the large. Attach a pair of

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Police Reactions, Legal Consequences

Ultimately, there is no way to predict for sure how the police will react, so there is probably little to be gained spending hours debating it in your group.

It is important to have a police liaison present to negotiate with the authorities or at least make sure they understand the situation, and reporters or other witnesses to temper or at least document their behavior. If they start to do something that seems dangerous, calmly inform them that your arm is inside the tube and that you are unable to remove it, and that a team of crack lawyers eagerly awaits the chance to sue them into oblivion. Police will always try to intimidate you; call their bluff while maintaining your composure. They may use pepper spray or similar weapons on you, but this could cost them a lot in the public eye, especially if you bear this persecution courageously.

If your line is anchored at each end, they may begin by trying to disengage the people in the anchoring roles. If they can move the entire line out of the way and work on you once you are no longer blocking traffic, they probably will, but this will be difficult if you are seated or supine. If they can't move you all, they will work lockbox by lockbox, cutting the line into smaller, more moveable sections. The method the police use to cut you out will depend on how experienced they are. No police department wants a lawsuit, so they will probably try not to injure you. If you hide the location of the central bolt, they will have no way of knowing where your hands are inside the tube; this will prevent them from simply cutting the tube in half.

Often, the police will call in the fire department to use special tools designed for removing people from wreckage.

> Last time I locked down, the police brought special wooden frames to support our PVC pipe lockboxes, then slowly dismantled the boxes with wire cutters, saws, and various other tools.

It is also difficult to predict what your charges will be when you are arrested at the end of your lockdown. In the past, at least, the charge was often "incommoding," the same charge associated with blocking a street or similar conduit with one's body. The use of lockboxes is not a separate crime, though the police may make threats or try to tack on additional charges such as "possession of implements of crime" (PIC).

you issuing your statement. Either way, there will be curious passersby who deserve to be told more about what's going on and why, and perhaps to be entertained in the bargain. If your lockdown is going to create a traffic jam, and you are concerned that the action might be misinterpreted as an attack on civilian drivers, consider distributing peace offerings of some kind.

Those locking down can be dressed in symbolic or expressive garb or draped in a banner explaining the reason for the action. If your human chain is not connected to anything at the ends, you could conceivably move from one point to another while locked together, but this will not be easy or particularly safe. If you are planning on moving at all, you should practice in advance, and perhaps designate coordinators to talk everyone through certain movements or count off marching steps.

Whether you expect this to be an issue or not, it is wise to prepare a basic communication and decision-making structure in advance, if there are more than a couple of you planning to lock down together.

60926 cartridges ($35 for the pair). If the mask comes with 60921 or 60923 cartridges, you don't need the 60926 cartridges. In addition, get a pair of Pyramex V2G Plus goggles for $15 and seal the vents on them with hot glue. If you wear glasses, get the RX insert and prescription lenses.

The biggest downside of pairing a half-mask with goggles, however, is that it's hard to maintain a good seal between the two, as the goggles and the mask compete for the same real estate on your nose.

The Gambler's Choice ($60)

A surplus Russian PMK-3 will be less than 20 years old. If you can find a version that comes with the full kit, it has ballistic outsert[1] lenses and an adaptor for attaching it to the more common NATO-threaded filter system. Surplus masks are always hit-or-miss; we have not found specific documentation on the ballistic rating of the outsert lenses yet.

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[1] Most military gas masks can be equipped with ballistic "outserts" that attach to the outside of the lenses—without these outserts, the lenses are not rated for ballistic impact.

A Russian PMK3 mask.

If you want to double down on your gambling, a Russian PMK-2 can be as cheap as $25, though it could be 30 years old. The PMK-2 can come with ballistic outserts and an expired filter that ought to work for a while—but it will be difficult to replace the filter and who knows what condition the mask itself will be in. The cheapest of these masks ship directly from Russia with a fairly lengthy transit time.

Live Dangerously (Cheap)

Most of the time, you don’t get shot in the face with a rubber bullet or a tear gas canister. None of the people who contributed to this guide have been shot in the face yet. Tear gas drives everyone back who isn’t protected, whereas impact munitions only kill or blind people every once in a while. Lots of people are getting shot in the face, though. It isn’t safe to be on the receiving end of police violence.

We can only recommend eyewear that has impact-rated plastic. But if you don’t have access to it and you have to go out anyway, you need either a full-face gas mask (army surplus or otherwise) or a half-mask and goggles. Make sure your filters are either military-style (expired or not) or rated to handle both organic vapors and P100 particulate filtration. Make sure your goggles are sealed as best as you can. Make sure it all stays tight to your face.

Good luck. Don’t blame us if anything bad happens—we told you not to.

If you want to improve on something you already have access to, or if you have different tactical needs than we’ve outlined above, read on.

Practice and Transport

After all of the boxes are constructed, practice locking in and out of them. Do this alone until you have it down, then try it with a partner, locking at once into both sides of a box. Before an action, practice for speed and organization with everyone who will be involved, so things will go smoothly on the big day. To prevent confusion, you can label each end of each lockbox, and plan out which direction each person will face and the order in which people will lock together. It can help to have individuals involved who do not actually lock down on the line; not only can they help get things together quickly at the beginning, they can also provide food and water to the people who cannot move their arms, and help deal with police and others.

It can be a challenge to get all the lockboxes to the site of the lockdown. You could hide them nearby in advance, or bear them there in a march, disguised as puppets or banners. If you have access to a car, you can use it to drop off all the lockboxes at the very moment your group suddenly converges at the chosen site. If you are doing a long blockade line, you have access to several cars, and speed is of the essence, pairs of blockaders could lock together in vehicles before driving to the area, then all be dropped off at the site and link up in a matter of seconds.

A large group of people walking any distance with bulky lockboxes will probably attract the wrong kind of attention, especially if the authorities are on the lookout for civil disobedience, but you could come up with clever ways to camouflage them in a pinch.

As in all blockading, if you are blocking a road or highway that is in use, it is crucial to stop traffic first. This can most easily be accomplished by another group working in concert with those who lock down; it is a lot to ask of a small group that they stop traffic, then lock themselves together properly while holding it at bay. Angry drivers can be even more dangerous than police under these circumstances; be careful not to give them the opportunity to do anything stupid.

Once You’re Locked Together

The people who have come with you to play supporting roles can complement your blockade with a rally, street party, or outreach event. If you are blocking a street, there will be drivers to witness street theater or receive pamphlets; if you’re blocking the entrance to an official event, there may be reporters to record provide some control; if you are connected to another person by a chain directly, and one of you is pulled or dragged, both of you will bear the brunt of it.

Once the device is assembled, the holes drilled, the bolt secured, and the chain attached, make sure it all fits comfortably. Put some padding around the chain at your wrist, and pad the entrance to the tube if need be. If nothing else, wrap the chain in an old sock or two, and sand down the edges of the pipe to prevent it from cutting your arm.

The final step is to fortify your creation. Many police departments now understand how lockboxes are constructed and know how to disassemble them. This does not mean locking down is ineffective, since it still takes the police time to react, retrieve the necessary tools, and cut apart each lockbox; but it is worth brainstorming about how to stay ahead of their technology. The police are likely to try to cut the pipe to expose your hand and the carabineer, or attack the box at the bolt. Consider ways to slow this process. You could wrap the lockbox in materials that dull saw blades, for example, or wind layers of duct tape and wire around it, or cover it in viscous tar and sand, or weld rebar armor to it—or do all of these! The more layers of material that require different forms of cutting technology, the better.[10]

For heavy lockboxes that can anchor you in place, you could put a layer of concrete around your pipe, and a layer of plastic or aluminum drain tubing around that.

A police officer attempting to cut through a lockbox.

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[10] For example, barbed wire need not only appear in your life as an obstacle; you can also apply it yourself to obstruct the movements of your foes.

Protect Your Lungs, Protect Your Eyes

We are addressing two distinct goals here: protecting your lungs and protecting your eyes. You protect your lungs with respirators that filter chemicals out of the air. You protect your eyes with goggles, glasses, or visors—whether they are independent of your respirator or combined with it in one full-face system.

Protect Your Lungs: Respirators

A respirator—technically, an APR (air-providing respirator)—is a device that filters the air you breathe before you breathe it.[2] There are several classes of respirators or gas masks, including two that we're going to pass over completely: SCBA (self-contained breathing apparatus), which come with oxygen supplies and are used by divers and some emergency personnel, and PAPRs (powered air-providing respirators) that force air through filters via electrical power. We're going to focus on full-face respirators, half-mask respirators, and, to a lesser degree, disposable respirators. We'll also discuss impromptu air filtration and the current speculation about DIY respirators.

We'll look at two general, non-technical categories of respirators: military/tactical respirators and civilian/workplace respirators.

Military Respirators (Gas Masks)

Military and tactical respirators are chiefly used by the military and militarized police forces around the world. These are all full-face respirators—what you picture when you hear the term "gas mask." Almost all of them use the same kind of filter: a threaded 40mm filter that is NATO-standard, sometimes referred to as a STANAG filter. Current-issue US military (and presumably law enforcement) masks use a proprietary bayonet mount[3] instead that is self-sealing, making it easier to change filters in the field.

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[2] If you look at the hazardous chemical specifications of various chemicals, you'll notice that they list certain "protection factors" that are necessary to interact with them. The National Institute for Occupational Safety and Health (NIOSH) rates various types of respirators according to protection factor. SCBA masks are rated at 10,000, PAPRs are rated at 50-100, full-face APRs are rated at 50, half-mask APRs are rated at 10, and disposable APRs are rated at 5.

[3] The bayonet mount is the same model by which lenses attach to cameras: three tabs fit into three slots, then you twist it into place to lock it down.

These gas masks are often rated for a full range of threats from chemical weapons to nuclear fallout. Newer military models often include features such as speech diaphragms that make it easier to talk, multiple ports for filters that allow maximum airflow and enable you to swap out filters without removing the mask, and water systems that can be hooked up to a canteen or water bladder. Most models in use (currently or previously) by armed forces can accept ballistic lens or visor outserts that clip onto the outside of the lens or visor. You're going to want these if they are available for your mask. Military gas masks can be purchased for quite a lot of money new, or outrageously cheap on the surplus market. New military or tactical masks start at $200+ and most are in the $500 range. Some worthwhile surplus ones can be found for $30-100.

The surplus market for gas masks is notoriously hit or miss, and things are often mislabeled. Some, such as some of the old Russian gas masks, can be dangerous: some use glass eyepieces instead of impact resistant plastic, while others might come with expired cartridges that contain asbestos.[4] Below, we will list some common surplus models and discuss whether they meet the needs of modern demonstrators. Yellowed lenses can be fixed, but decayed rubber seals cannot. Older plastic lenses are substantially less impact resistant—in our impact testing, we shattered the lenses of an Israeli gas mask with nothing more than a BB. Surplus masks can range from $30-500 depending on the rarity or usefulness of the mask. Good-enough masks (minus ballistic rating) seem to be consistently available for $80-120.

40mm filters.

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[4] Realistically, this is only a danger if you manage to find an 80-year-old filter from an Eastern bloc country.

It's important that your pipe be the right diameter; you should be comfortable sliding your arm in at least to your bicep. Unless your arm is especially small or large, the pipe should be between 4 and 6 inches in diameter.

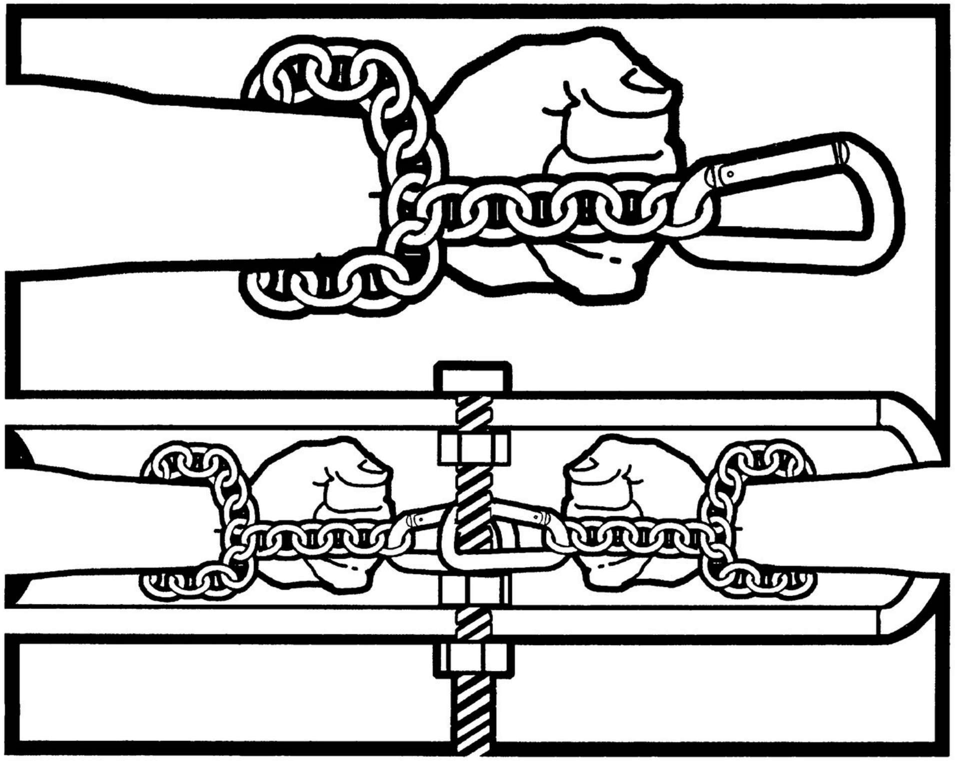
After the pipe is cut so that both people who are to use it can put their arms in as far as they want and touch fingers, secure a bolt at the point where their fingers touch. The length of the bolt should be longer than the diameter of the pipe; if you use 5 inch pipe, make sure your bolt is at least 5.5 inches. Stay away from bolts with sharp threads or a sharp point on one end, unless you are prepared to modify them for safety and comfort. Your bolt should be thick and difficult to cut; it will probably be the weakest link in the chain, so you'll want to make sure it's as secure as possible.

Drill a hole all the way through one wall of the pipe and out the other. If you have to drill the top hole first and then flip the pipe to drill the bottom hole, make sure the holes line up! Put the bolt through both holes. It should be slightly off-center in the pipe, so the people locking to it can fit their fingers around it and have space for their knuckles. Now use nuts to secure it in place; these can go inside the pipe, or outside it, or both. You can use powerful glue to strengthen the bolt; better yet, if you have the means, weld it into place.

You could include multiple bolts in your design, to make it harder for the police to know where to start. If you have more than one bolt, you can also experiment with attaching yourself to all of them.

Now you have to build the chain bracelet that secures you to the bolt inside the pipe. Cut a length of chain that can loop around your wrist at one end, and attach at the other end around the bolt in the pipe; it will be in the shape of a P. Experiment with chain length until you have a comfortable fit. Make the clasp that holds the chain around your wrist permanent and durable; use a carabineer to clasp the chain around the bolt, so you are able to unclasp from the lock box in an emergency.

Attaching the chain to the central bolt with a carabineer is a very secure and safe option, but there are others. For a simpler, though weaker, variation, skip the central bolt entirely and run a length of chain through the tube to attach your wrist to the wrist of your partner. This option might be useful if you have limited time and funding to prepare for the action. A benefit of the central bolt is that when you are pulled, the bolt absorbs some of the force, and gripping it can



Constructing lockboxes can be a fun group activity.

Make sure the people who are going to use the boxes try them on and modify them according to arm length and other variables. How much of your arm goes inside a lockbox is a matter of preference and tactical strategy, but on average your pipe should be about 4 feet in length. The more of your arm is covered by the PVC pipe, the more of your body is safe from police action. For example, if your bicep is exposed, the police could attempt to use pain compliance there to force you to unlock yourself; if your entire arm is in the pipe, this is impossible.

Everyone's arms are unique. If you are locking down, you need to be able to put your arm far enough into the pipe to grab the bolt, so you can easily connect and disconnect your carabineer. If the people who are to use the box can be present during the construction, measure their arms and custom-fit the pipe. If this is not possible, build the box to a length that almost anyone can use—say, between 3 and 4 feet. If you are using PVC pipe, it can easily be cut with a standard hacksaw. For more long-lasting lockdowns, use more durable piping.

Civilian Respirators

Civilian/workplace respirators come in both half-mask and full-face styles. They are manufactured by a number of companies, many of which use their own proprietary filter attachment systems. We will be focusing on the masks made by 3M because they are the most plentiful and because some other companies employ their "bayonet"-style mounting system for filters (which they call "cartridges"). If you already have a mask with a proprietary filter system, such as the ones made by Honeywell or MSA, make sure your filters are rated to OV and P100 protection. Some of the low-priced Chinese models flooding the US market in response to COVID-19 seem to have their own filter systems, while the ones we've tested use 3M's bayonet system. These cheaper masks could enable you to save money, especially if you are buying them in bulk.

If you are using a mask with a proprietary system, read on to the filter section to identify which filters will work for you.

The half-face COVID-19 masks that are made of cloth but include exhale valves and replaceable carbon filters are unlikely to be much use against chemical weapons. They likely don't protect people around you from viruses, either, since they don't filter on the exhale.

We have not been able to find any civilian-style full-face respirators with visors that meet ballistic impact standards (discussed below in the "Protect Your Eyes" section), but the 3M models and some others are rated for general impact resistance and seem to use the same plastic as ballistic-rated masks do, based on our initial impact weapons testing. One street medic we spoke with prefers to wear a 3M 6800 full-face respirator on the grounds that its civilian styling puts patients at ease more readily than a military look would. Full-face civilian respirators range around $60-70 for generic imports and up to $150-200 for name-brand items. Half-masks are substantially cheaper—as little as $8 for generics and $30 for a name brand.

3M manufactures three different models of both half-mask and full-face respirators. Any of them are adequate to our purposes, though some people we've talked to find a better seal with the slightly more advanced silicone facemasks. It's probable that the 7500 series are the best half-mask respirators for our purposes and the FF-400 series is the best civilian full-face respirator for our purposes. The FF-400 series comes equipped with a speaking diaphragm, so your voice will be less muffled.

The 3M Ultimate FX Full Facepiece Reusable Respirator FF-402.

Each of the 3M models comes in three sizes, but “medium” will fit 80-90% of people and the sizes overlap with each other. To some degree, sizing is more important for comfort than efficacy.

For $15, you can buy an adaptor to shift from 40mm threaded filters to bayonet filters or vice versa—so don’t limit your choice of masks based on what filters are available alone.

Appendix: 3M Respirators—A Taxonomy

Half-mask models

—6000 series [basic]:

- 6100: small
- 6200: medium
- 6300: large

—6500 series [silicone rubber]:

- 6501: small
- 6502: medium
- 6503: large

—7500 series [silicone rubber and better breathability]:

- 7501: small
- 7502: medium
- 7503: large

Full-face models

—6000 series [basic]:

- 6700: small

When planning, take into account the strain of being locked in place for a long period. If the lockboxes are not supported by something, those locked together will quickly be worn out by holding them up. There are also the matters of food and blood circulation to consider.

Gathering Materials

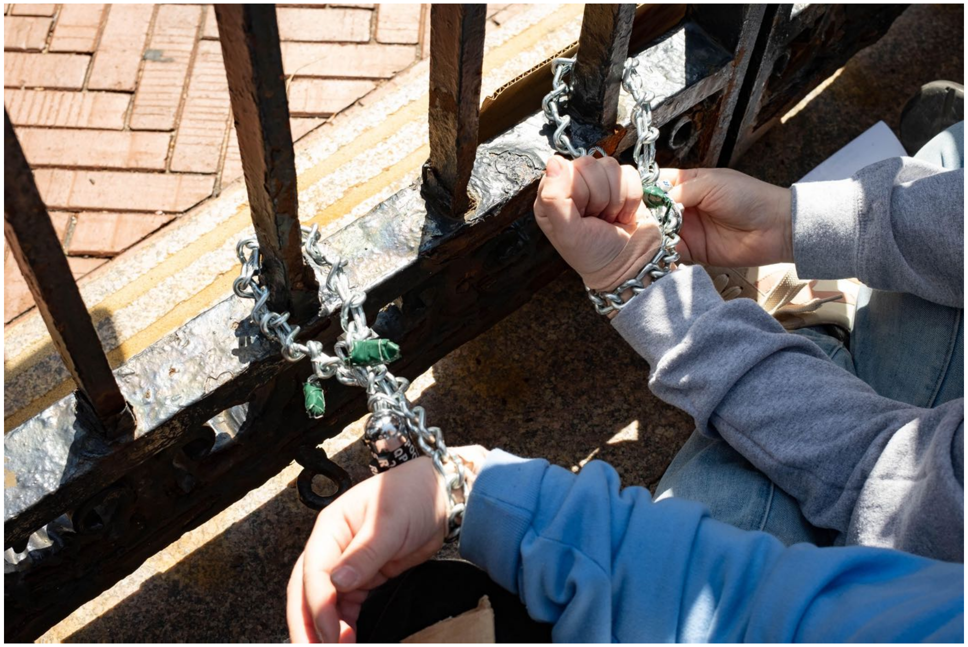
Once you have worked out your plan, the next step is to gather materials. These can be expensive, so look around for places you could acquire them for free. PVC pipe can be found at construction sites; chain can be cut from a locked dumpster; tools can be borrowed or stolen. If you do not want to draw attention, you may prefer to buy the supplies at multiple locations. While purchases of bolts, carabineers, and glue will not attract attention, a septum-pierced revolutionary may raise eyebrows if she brings thirty feet of PVC pipe to the counter. Rumor has it that before and during mass mobilizations, store employees are told to look out for such purchases. Use the same care you would for buying spray paint, crowbars, bolt cutters, or glass etching solution.

Do not use a credit card if you do not wish to create a paper trail.

Design, Construction, Adaptation, and Fortification

Summary:

1. Cut the pipe to the appropriate length.
2. Drill a hole all the way through both walls of the pipe at its midpoint (or thereabouts, depending on the differing armspans of the two who will be using it).
3. Pass a bolt through both holes.
4. Secure the bolt.
5. Cut a length of chain to fit around your wrist and reach up to the bolt.
6. Fasten a carabineer to the chain by which to secure it to the bolt.
7. Repeat steps 5 and 6 for the person who will share the lockbox with you.
8. Fortify the lockbox.



On April 2, 2025, a Jewish-led group of Columbia University students chained themselves to the locked campus gates in solidarity with Palestinian students, demanding that the University provide the names of the trustees who reported Mahmoud Khalil to ICE. Chains may suffice, but a lockbox will usually provide more staying power.

circuit” with your human chain, connecting it at either end to immovable points, it may be easy to move you out of the way even if the lockboxes that connect the participants are secure. To measure distances quickly without drawing too much attention to yourself, you can count your steps heel-to-toe across an area, or run string or yarn across it. You’ll also need to take into account the sizes of the lockboxes you are making and the people locking down. If a street is 20 feet wide and your lockboxes are 3 feet long, you’ll probably need five or six people.

Plan your formation carefully. If you are locking down in a line, the two people on the ends can be locked to stationary objects—with bicycle U-locks around their necks, for example, or by a less secure means such as chain locks. If you use bicycle locks or any other locks that require keys, have an accomplice on hand to spirit the key away quickly, or be prepared to hide it where it cannot be recovered. For a less durable blockade, you could leave the ends of your formation open and sit or lie down. Alternatively, you could close the formation at both ends, locking down in a circle, or form two lines crossing each other in an X.

- 6800: medium
- 6900: large

—FF-400 series [more advanced]:

- FF-401: small
- FF-402: medium
- FF-403: large

—7000 series [substantially more expensive]:

- 7800S-S: small
- 7800S-M: medium
- 7800S-L: large

Fitting a Respirator

Whether you are wearing a half-mask or full-face respirator, it is important to check the fit *every time you put it on.* To do this, start by blocking the cartridges with your hands and breathing in. You should create negative pressure in the mask, with no air seeping in. Then put your hand over the exit valve and breath out. It should create positive pressure in the mask, with no air escaping. When it comes to performing this test, some masks are easier than others; with civilian masks, it can be difficult to use your hand to block the filters effectively.

Some workplaces test fit by putting something that smells strongly—like ground coffee—or some kind of mild irritant under the wearer’s nose to see how they react.

Respirators are not designed to fit over beards, though people with beards have learned that if you coat your beard and the rubber seal with an awful lot of Vaseline, it will form a seal. This seal is hardly permanent, and it appears that CS powder is fat-soluble, so it might mix painfully with Vaseline the way it does with skin moisturizers and makeup. A doctor we consulted argued that a chemical burn at your beard is probably better than getting chemicals in your eyes. Regardless, shaving your beard is the safest option. Even a few days of stubble might be a problem, necessitating Vaseline or shaving.

We spoke with one person who does not want to shave their beard; they simply accept that the air will be a little bit “spicy” and still find their mask to be very useful even without a proper seal. We cannot recommend this, but it may be relevant to your own cost-benefit analysis.

It is difficult to source gas masks for children. They exist, but they are not produced in the same quantity. MIRA, the only supplier we were able to find that stocks them was sold out at the time of writing. Sometimes you can find Israeli surplus masks for children, as well. MIRA also makes a gas mask carrying bag that enables the user to safely transport infants or pets.

The biggest disadvantage to pairing a half-mask respirator with goggles is that it becomes hard to get a proper seal on both at the same time. This is especially true with larger masks and larger goggles. The second biggest disadvantage is that it doesn’t protect all the skin of your face from chemicals, and chemical weapons burn on your skin as well as in your eyes or lungs.

Filters

You need to make sure your filter is rated for both oil-based particulate matter (P100 filtration) and organic vapor.

If you have a NATO-threaded military mask: For a 40mm threaded NATO cartridge, you need *either* a CS/CN/P100 filter, which can be difficult to come by as a civilian but seems to be what is commonly issued to police, or a CBRN filter, which is more commonly available but also more expensive. A CBRN filter is overkill for demonstrations, as it is designed to protect against chemical, biological, radiological, and nuclear threats. Fortunately, expired-but-unopened CBRN filters should do the job and are much cheaper.

If you have a 3M mask, you need either 60921, 60923, or 60926 filters.

If you have something else, read on.

If it is likely that you are going to be exposed to riot control agents, you want your mask to filter two things: airborne particulates and organic vapors.

Particulate filters in the USA are rated by how oil-resistant they are—N are (N)ot, R are somewhat oil (R)esistant, and P are oil (P)roof—and what percent of airborne particulates they filter out—95%, 99%, or 99.97% (called 100). This

Instructions

A lockbox is a piece of pipe by which a person can be locked securely to another person or object. The average lockbox accommodates two people; with several lockboxes and people, you can form a human chain.

Lockboxes utilize the width of your torso and arm span to take up space. To lock down, you attach yourself to a mechanism inside a piece of pipe; in order for a police officer to unlock you, he would have to get his arm into the pipe as well, but as the pipe fits snugly around your arm, this is impossible. Should police attempt to pull you apart, the strain will be on the metal chain and bolt, not your shoulder joints, assuming your box is built correctly. If you use a carabineer to connect to a bolt within the pipe, you will be able to detach from the box immediately whenever you choose. With lockboxes, a group of people can swiftly move into a space, block it, and defy the efforts of police officers who would remove them.

Scouting the Target, Planning the Action[9]

The first step is to scout the area you want to blockade.

There are a wide variety of environments in which you might choose to apply lockboxes, but for the purposes of this introduction, we’ll assume that you will be operating in an urban environment. You could blockade the entrance to an event or business, or an entrance to a tunnel, highway, or access ramp. The first step is to figure out where the traffic—whether it be car, foot, or other—can best be bottlenecked. Often, if you block one street successfully, you can snarl traffic in a large area. Look for streets that lead to main roadways, and watch the traffic patterns. If you are planning to block a road, listen to traffic reports; determine which roads gridlock easily and which roads feed major transportation routes. Note all the details of your target, including the length of traffic lights, which lanes are open at certain times, and which directions the majority of cars turn.

Once you have found the location that best serves your purposes, you’ll need to determine how many people it will take to block it. If you have a well-chosen target, but you do not have enough people, traffic will still be able to pass, and you will simply be a nuisance, not a blockade; if you cannot create a “complete

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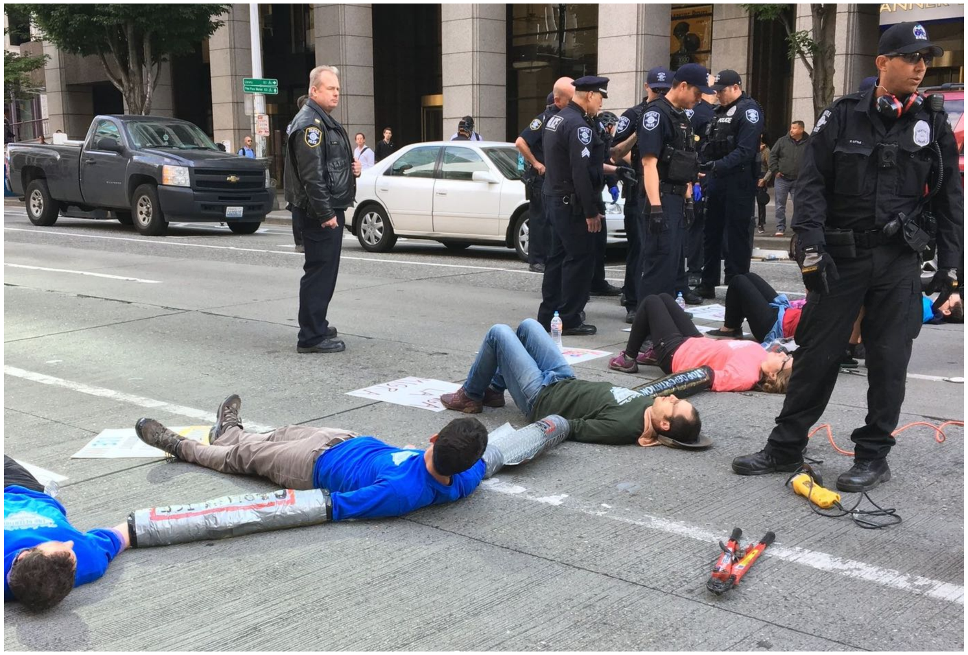
[9] Subsequent to the original publication of this guide in the book *Recipes for Disaster,* the Swedish d-beat band Auktion took this section title for the title of their hit song of the same name—a dream come true for any anarchist publisher.



A June 2018 demonstration against the Immigration and Customs Enforcement office on Second Avenue in Seattle. Impeding the actions of heartless mercenaries determined to rend apart communities is a moral duty if there is any such thing.

Ingredients

- Metal or plastic tubing or piping—*such as PVC pipe*
- Bolts and nuts—*at least one bolt and one nut for each box*
- Chain or rope
- Carabineers
- Glue—*optional, but encouraged*
- Hacksaw
- Drill
- Bolt cutters—*optional*
- At least one person ready to put their body on the line

explains the name of the N95, the mask commonly worn to protect against COVID-19. You're looking for P100, the highest level of protection. These aren't substantially more expensive and there seems to be little reason to use any other particulate filter, unless your particular mask setup only allows access to N95, which is still substantially better than nothing. The European standard does not rate for oil resistance, only particulate filtration: P1 masks filter at least 80% of particles; P2 masks filter at least 94% of particles; P3 masks filter at least 99.95% of particles.

While all of the common tear gasses and pepper sprays are comprised of particulate matter rather than gasses or vapors, the airborne particulates themselves can release organic vapors. You need the particulate filter (generally made of fiberglass paper) to stop the particulates, followed by an organic vapor barrier (generally a bed of activated charcoal). The NIOSH certification for organic vapor protection is "OV"—look for this on your filter or its documentation. Some other OV irritants include pesticides, solvents, and paint fumes, all of which masks often reference in their sales information.

We've seen guides for protestors based on front-line experience that claim only OV filtration is necessary. We've seen other guides that claim only P100 is necessary. Most seem to agree it is the combination that is necessary, but we suspect that one alone would do in a pinch.

Particulate filters do not become less effective at filtering out particulates over time. Rather, it is necessary to replace them when they become so clogged that they cause difficulty breathing.

Organic vapor barriers *do* become less effective over time with use, as the charcoal becomes saturated. Both heat and humidity reduce the effective lifespan of charcoal filters. Heat causes the charcoal to separate, while water vapor can saturate the charcoal and prevent it from absorbing active agents. You should replace your organic vapor filter as soon as you can smell chemicals leaking through the filters into the mask from outside. Unopened-but-expired filters are generally considered usable—for organic vapors and particulates only—if they were vacuum-sealed, but if humidity was able to reach the charcoal, they are probably ruined. Multiple comrades who are military veterans told us that the military uses expired filters all the time for the tear gas chamber without any problems. In any case, use expired filters at your own risk.

NATO-Threaded Filters

With 40mm threaded filters, you need “CS/CN/P100” filters at the minimum. AVON, Honeywell, and MSA make versions of these, but they can be hard to source as a civilian—especially amid a pandemic. If you’re going for overkill, get a CBRN filter—basically, a single filter that protects against almost any potential threat. MIRA Safety makes a high-quality filter of this kind; 3M also makes them. Be careful buying CBRN filters off of ebay or the surplus market: many are “new” in that they have not been used or opened, but were manufactured decades ago. Look for the manufacturing date, or roll the dice and buy cheap expired ones. Don’t trust these for anything but riot control agents.

For all masks, you need at least one filter. Some masks can optionally take two or even three at a time in order to increase airflow, an advantage for situations that might involve running or other strenuous exercise.

3M Bayonet Filters

3M masks and their clones use a three-prong bayonet style filter attachment. Some other proprietary attachment systems are similar but not interchangeable with 3M, but 3M are the most common. If you use these, you’ll likely end up with 3M-brand filters/cartridges, though clones of both the masks and cartridges exist. Note that 3M distinguishes between cartridges (the part that absorbs gasses and is usually made of activated charcoal treated with various chemicals) and filters (the part that blocks particulate matter). Make sure you get both. You can do this by buying separate cartridges and filters as well as the adaptors that connect them together, or by buying combination cartridges that come with filters pre-installed. Obviously, the latter is simpler.

Hats off to comrades in Hong Kong who have done the work to figure out what cartridges and filters you need, as they lack easy access to the combination cartridges. We’ve heard that they are not available in the UK either.

If you want a combination cartridge, your options include the 60921 (organic vapor + P100), 60923 (organic vapor and acid gas + P100), or 60926 (multi-gas + P100). As this goes to press, these are all about $15-20 each on ebay. You need two, and they usually come in pairs.

If you want to build your own, whether because you already have stock available or because you live somewhere without access to the 6092x filters described

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the equipment that is to destroy a forest, or lock authorities out of a building that has been occupied in a political action.

One of the most common implements for blockading is the lockbox.

Locking Down with Lockboxes

When it comes to blockading, lockboxes can be very useful, assuming that you are not facing adversaries who are willing to do serious harm to you and that you are willing to be arrested.

The design described here has been used in many cities, including some in which the police are experts at handling protests—and all the same, it can take police hours to move blockaders who use these devices from a busy street. This is one of the simplest designs; there are many other possibilities. You can make lockboxes with 90-degree angles in them that accommodate both arms of one individual, so one person can comfortably lock down to a gate, a truck axle, or even a railroad track. For serious engagements, you can make big concrete barrels with lockboxes fitted inside them, or dig a hole in the ground and build a vertical one-way lockbox into it with concrete and rebar, or drive a junker car into place, disable it, and lock down to it.

Lockdowns can be used to stop movement into and out of an area, providing a spectacle perfect for attracting media or other attention. They can stall traffic to allow support teams to hold an awareness-raising rally, and distribute leaflets to or otherwise engage drivers stuck in traffic. After blockaders are removed from the area, police generally block the area for another hour or more themselves, lengthening the impact of the action. Lockdowns can appeal to the public by showing that people are dedicated enough to put their bodies on the line; they are descended from a long heritage of non-violent civil disobedience that many civilians find less threatening than other brands of direct action.

A Demonstrator’s Guide to Lockdowns and Blockades

A complete guide to assembling and employing lockboxes and other means of blockading.

There is a broad spectrum of tactics to choose from between simply holding up a protest sign and setting things on fire. If you are looking to intensify a pressure campaign or to stand your ground more effectively when challenged, consider the following options.

From the vantage point of 2025, more than two decades after the original version of this guide was published in the book *Recipes for Disaster*, civil disobedience has become somewhat more dangerous as far-right politicians have put more laws on the books and police and other fascists have become less concerned with preserving human life. Civil disobedience presumes that your adversary is constrained from inflicting permanent harm upon you. In some cases, if you are prepared to get arrested, you may be able to accomplish a great deal more by remaining mobile and risk-tolerant rather than engaging in an activity that is scripted to end in arrest.

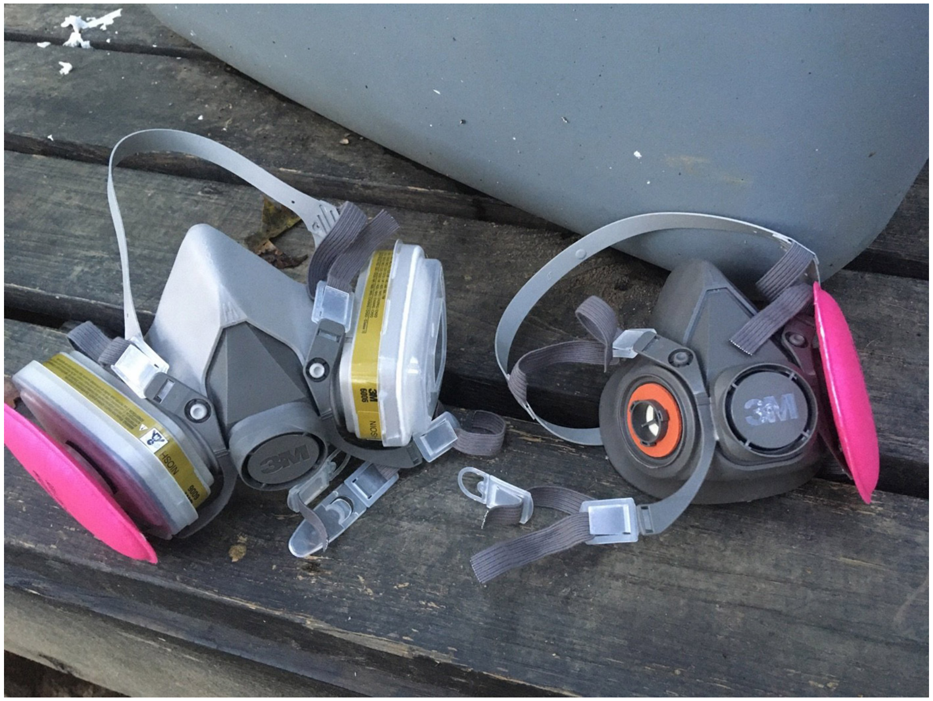
Nonetheless, there are still many regions and contexts in which the following information will be applicable.

Why, Where, How

There are many reasons to blockade: to call attention to or prevent an injustice, to support other direct actions by securing a space or creating a distraction, to decrease traffic fatalities.

There are many sites that can be blockaded: highways, factory and shopping mall gates, business districts, the front doors of restaurants that are to host corporate dinners or party delegates. Intrepid blockaders can lock themselves to

above, start by buying a set of cartridges—the 6001 (organic vapor), 6003 (organic vapor and acid gas), or 6006 (multi-gas). Next, purchase one of the various P100 filters, which come in two styles. Some, like the 2091, have their own bayonet connectors, as they are intended for mounting directly onto respirators. Other filters are simple pads, such as the 5p71—which is only a P95 filter and therefore not advised (though we have not tested a P95 ourselves). If you choose a bayonet-connecting filter, you need a 502, which is an adaptor that snaps onto the cartridge and provides a bayonet mount. If you choose a pad filter, you need a 501, which is an adaptor that snaps onto the cartridge and holds the filter directly.



Two 3M half-mask respirators showing several filter setups. Left to right: a p100 filter attached to an OV cartridge with a 502 adaptor; an N95 filter attached to an OV cartridge with a 501 adaptor; a blank bayonet attachment point; a p100 filter attached directly to the mask. Missing: an all-in-one cartridge, often identifiable by a bright pink outside shell.

3M marks their P100 cartridges by making them neon pink. Some people have expressed concern about this making the user identifiable, as it violates the all-black black bloc aesthetic—although if enough people are using pink filters, it will be somewhat less of a problem.

Replacing Filters

Studies have shown that under stress, even trained soldiers struggle to replace filters while holding their breath. The current US military model mask, the Avon M50, has self-sealing bayonet-mounted filters that enable the operator to change one filter at a time while continuing to breathe through the other.

Most masks you have access to will not have this feature. To change filters, you'll probably have to hold your breath or exit the impacted area.

A comrade in Portland reported that they prefer the 3M cartridges with separate particulate filters (6001 cartridges with attachable P100 filters) because the P100 filters can be swapped out without taking the mask off, relying briefly on the cartridge alone for filtration.

Another comrade says that they have been using the same gas mask cartridge (a military-style 40mm one) since 2011 and have never tasted spicy air through it. This supports the theory that most of the important filtration is being done by the particulate filter, which is never used up, only clogged.

Others, in Portland, report that they their filters are lasting about 30-40 hours each.

Some surplus masks employ "cheek" filters located inside the mask. Changing these filters is a laborious process, and some YouTubers have found it's easy to rip the rubber of the mask while doing so if the mask is old. Still, one person we spoke with prefers these masks, having seen police grab people by the external filters of other masks, since cheek filters do not present an easy handle for grabbing.

Cleaning and Storing

You should clean your respirator after each time it is exposed to chemical weapons. 3M sells a product for this: "504 Respirator Cleaning Wipes." These are affordable, but likely unnecessary. What they contain is a trade secret. Most people just use soap and water, to good effect. Don't soak your filters in water, just wipe down the outside with soap and water. Then remove the filters and store them in a ziploc bag or other airproof container so they do not absorb moisture from the air.

CAT COMBAT APPLICATION TOURNIQUET
NSN6515-01-521-7976
LOT 110G765

Appendix IV: Building an Individual First Aid Kit (IFAK)

IFAK Build—Current lowest price per kit: $95.25, not including tax, shipping, or a bag or pouch for the kit. Here are the recommended contents, with links to sources: [find on <narescue.com> and <rescue-essentials.com>]

- CAT Gen 7 (1) $30/each: available from NAR, Chinook, Rescue Essentials
- ETD (2) 4" flat, $7 each
- Chest seal (2) Hyfin twin pack, $15/pair
- Hemostatic gauze (1)—your options include ChitoGauze z-fold, 3"x4yd, $32/each (on sale) here, Celox rapid Z-fold, 3"x5'; you may need medical authorization to purchase. $34 each here, and QuikClot combat gauze z-fold, 3"x4yd, $43 each
- Sharpie (1) Staples 12 pack, $8/12 on sale (.66/each)
- Gloves (2 pair) Nitrile exam gloves size L, $13/100 ($.52/kit)
- Shears (1) 7.5" stainless Shears, $3 each
- Zipper bag for gloves (1) "sandwich size", $3.50/50 ($.07/each)

coming from or if leaving was safer. So we pushed back along the line of people trying to see Milo talk, well after the event had been closed off. The police never moved in, the “active shooter on campus” alert was never activated, and we stayed in that crime scene—for hours.

Appendix II: Additional Resources

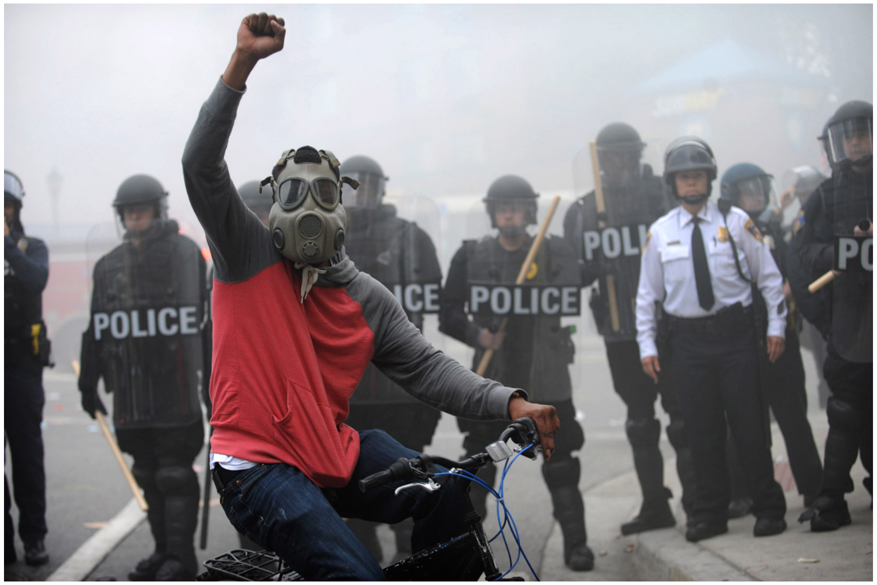
- Live Like the World is Dying podcast recently aired an interview with an experienced street medic who gives detailed instructions about responding to gunshot wounds at demonstrations.
- In this podcast, Hex, who survived a shooting attack by a fascist at a demonstration on January 20, 2017, discusses justice, violence, patriarchy, and compassion, the critical importance of healing, and how to redefine resistance.
- Protocols for Common Injuries from Police Weapons—A guide for street medics responding to non-lethal police munitions and chemical weapons

Appendix III: Using a Tourniquet

- Locate the wound.
- Apply tourniquet, over clothes if wound is clearly on an arm or leg and you can see a lot of blood.
- Make sure the red tip is pointing towards the heart. Place the tourniquet as high as possible. If the wound is below a knee or elbow, place the tourniquet just above the joint.
- Pull tail tight. Tighten the strap as tight as you can.
- Turn the windlass until the flow of blood stops.
- Mark the time.
- Keep talking to the person you are treating.

A Note on COVID-19

Unlike cloth and surgical masks, respirators do not protect the people around you from your germs. However, much more so than cloth or surgical masks, they *do* protect you from the germs around you. One protestor reported wearing a cloth mask over the exhalation valve in order to block droplets for the sake of other demonstrators.



A cheek-filtered gas mask in use in Baltimore in 2015 during the uprising in response to the police murder of Freddie Gray.

Visors and Lenses

Full-face masks either use full-face visors or individual lenses over the eyes. Lenses are more common in military models, while visors are more common in civilian models. A full visor offers much better visibility. It’s possible that it is harder to make a full visor more impact resistant, although we’ve found both ballistic and non-ballistic examples of both types.

A mask with lenses can be more convenient for those who are going to be using the optics of a long weapon (like a scope, red dot, or iron sights on a rifle or grenade launcher), as it permits one to shoulder the weapon better to get what is called a cheek weld and view down the barrel more clearly. Of course, this is not generally useful to demonstrators. All in all, a full-face visor seems preferable.

Off-Brand Civilian Masks

We will continue researching off-brand masks, most of which are from China. Some are rated as impact resistant; some use commonly available filter styles. So far, we have tried the JJKK and HAOX models. Both form an adequate seal against our faces in fit testing, though we have not taken them out into tear gas yet. Both have impact-resistant visors that performed identically to the American brand 3M when we shot them with various impact munitions—which is to say, they performed well. It's been suggested that purchasers should buy from BangGood or Amazon rather than Ali Express, Baidu, or eBay for these types of masks because the quality control is slightly better. A few comrades dealt with a nightmare with a mask order early on in the pandemic as a result of poor quality control.

It might conceivably be possible to work directly with manufacturers to produce masks to your specifications, or at least to purchase them in bulk. Ambitious groups could consider trying to do this for their city or region.

A comrade and I pushed our way through the crowd to where he was. To get there, I walked through something hanging in the air—my brain wouldn't put it all together for a while. It wasn't a smell, it was more of a taste, a cloud in the air that had a tang of metal. Once we reached him, the look on his face told me that I was in over my head. That, and the sound. He was making a sound that you just don't make. A scream and a gurgle mixed into one. I don't know how he was still standing. I got to him first and he leaned into me, all dead weight. The smell of his leather jacket and the press of him onto my smaller frame in that moment of desperation is one of the things that would enter my dreams and wake me for years after. It was as if I was carrying a dead but still living body.

He stared right at me, but looking past me. I realized he was dying. But I had no idea why. Reasons flashed through my head; there was almost no blood and I couldn't find anything. We didn't walk that far—twenty feet at very most—and the best I could come up with was that he must have hit his head, only a head injury would make him incoherent like that.

And then as quickly as I had taken his weight, the medics took him. His weight left mine and we were uncoupled from that moment. I stared at the medic, who I thankfully trusted, and all I could get out was "He's hurt, I don't know," or something like that. Besides walking him out of the danger of the immediate moment, I felt totally useless. The medics began doing their part, on the ground where there was a fair amount of blood now, trying to run through what their training had taught them. I heard the crowd as a low din—that thing that happens when you're about to pass out and the audio goes to the end of a tunnel. But that was when I finally put it together: pop, metal, gurgle.

Someone had shot him.

The police swooped in and took him, pulling the trained trauma medics away by force as we all screamed from the other side of a police line. Now everyone knew he was dying, that something had gone wrong. I wanted to scream that he had been shot; I started to, but then I realized that it might cause people to panic. I was just barely aware that I was already panicking. I found one of the medics; they confirmed that someone had shot him.

The police loaded him into the back of some kind of open-air vehicle—campus cops with a golf cart. And the demonstration continued. I panicked openly at that point, finding my crew and demanding that we leave, that "they" were shooting at us and we had to go. But at that point, I didn't even know where the threat was

I’m thankful that I happened to be parked close that night. I’m thankful that so many people around us wanted to help. I’m so thankful that people realized we needed them to lead us to the hospital. I’m thankful that the transfer to the trauma center happened quickly enough and I’m thankful for adept and willing surgeons. I’m thankful that my friend’s inner will was strong enough that he survived. I’m so thankful he lived. I’m thankful that there are things you can all do, too, to make it likely that things will turn out as well as possible if you ever find yourself in a similar situation.

And I am thankful for riot angels. May they be by your side if you ever need them.

A Single Pop

We all heard it. A single pop. It rang through the night, oddly out of place after hours and hours of hushed scuffles and the rustling of an agitated crowd. Hundreds of people were in the square—many lined up to get inside the event, and possibly an equal number trying to stop them. Red hats sailed above the crowd like short-range fireworks as people snatched and threw them. It was a mess, the conflicts impossible to follow; eggs, paint bombs, pepper spray, and punches coming at odd angles and from all directions. The few police that were on hand didn’t intervene. Stepping back from the square into the dark campus streets, the entire situation looked like a poorly directed fight scene in a low budget play.

But we all heard the pop. Just the one. Instinctively, the black-clad crowd dispersed throughout, the red hats all looked up. Given our knowledge up to that point of what happens at demonstrations, we assumed it was a flash-bang grenade. That was the only thing we thought could make that noise. But there was no second bang. Everyone’s eyes refocused on the stalemate around them. Pushing and shoving, some reinforced banners and phones being snatched, but a relative calm.

Looking up across the square, I caught a glimpse of something out of place. It was someone I recognized, someone I knew was in trouble. He had been trying to ensure that no one would get hurt, mixing distraction and de-escalation. Now something was wrong, but it was impossible to tell what it was.

Surplus Masks

Surplus military masks are another cheap option for full-face gas masks. They can be hard to source reliably, as many retailers (or else distributors serving retailers) lie about dates and potentially about features. This is also true for filters, and especially true on ebay. Both the rubber used for the seal and the plastic used for lenses and visors degrade over time, particularly when exposed to sunlight; both in our experience with testing and in anecdotes gathered from the street, they seem to be notoriously prone to breaking. Most surplus masks come in three sizes—small, medium, and large (generally numbered 1, 2, and 3, respectively, with the number displayed in the rubber of the mask)—but often, you cannot choose the size of mask when you purchase it online. Whatever mask you get, make sure it seals tightly to your face. Even a low-quality or wrong-sized mask will protect you as long as it seals to your face and is supplied with an adequate filter.

If you can get a model number and a country of origin, you can cross-reference seller claims with online military gear sites.

Tracking down the ballistic rating of the lenses and visors has been challenging. It would be very useful to identify a surplus mask that accepts 40mm NATO-threaded filters and includes ballistic lenses or visors (usually as a separate outsert). For those willing to forgo ballistic-rated lenses or visors, surplus masks are often the best option.

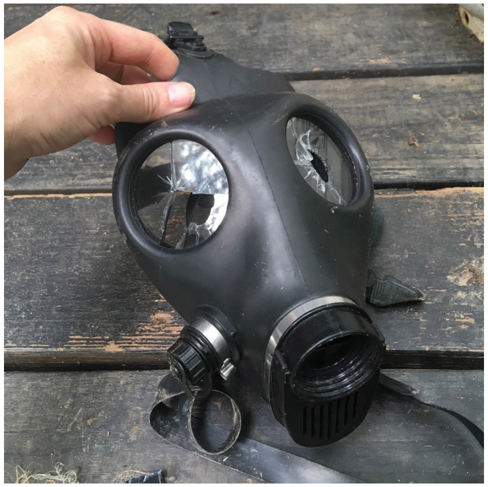
The primary current US military model is the Avon M50; it can be found for $250. While we generally don’t recommend masks that use proprietary filters, the M50 filters are reasonably cheap (currently $50 for a pair) and, as previously mentioned, you can swap them out in the field without exposing yourself to gas. Ballistic outserts are available cheaply for this mask as well; we found one for $20. The C50 model is the civilian model of the same mask, though it is used extensively by law enforcement.. The main difference is that it accepts 40mm NATO filters. For better or worse—usually worse—wearing this mask will make you look quite a bit like a soldier or a cop.

The Avon M40, which the US military used from 1986 to 2009, accommodates ballistic outsert lenses but does not come with ballistic lenses otherwise. 3M produces a civilian clone called the FR-M40 that is identical in every way. 3M also produces protective outserts for the lenses, but we have not been able to determine their impact rating.

The US Air Force and Navy has used the MCU-2P since the 1970s; any surplus option might be from any year in that range. They range from $150 to $300 on ebay. You can learn how to identify models and years here. While some documentation claims the MCU-2P visor is ballistic, a specific ballistic outsert is available for around $75. This implies that the visor alone is not ballistic.

The Russian PMK-3 (used from 2000 until recently, available for $70) and PMK-4 (in use since 2017, much more expensive) can make use of ballistic outserts as well, which often come with the full kit. Also included in the full kit is an adaptor to connect their proprietary filter system to the NATO-threaded system. The PMK-2 is even cheaper—around $30—and often comes with ballistic lenses, but can only use the 40mm-GOST filter system (used by Warsaw Pact countries).

A National Geographic filmmaker was wearing a Czech M10 (a clone of the US M17) iin Portland, Oregon in July 2020 when federal agents shot him in the face with a .68” round from an FN303 air gun, shattering the plastic lens of his mask and severely damaging his eye. Both of these masks can optionally be used with ballistic outserts, which the filmmaker did not have. These are the two models of mask we’ve found that use cheek filters, discussed above.



We carried out impact testing on this Israeli 4A1—with dismaying results.

The Israeli M15 is used by the Israeli Defense Forces and its civilian model, the 4A1, is distributed to Israeli citizens. Both are affordable on the surplus market. Most are simply labeled for sale as M15 masks, but you can tell the difference because the 4A1 has round eye-holes instead of the odd-shaped ones used on the M15. The manufacturer, Shalon Chemical Industries, claims that the plastic lenses are impact resistant, and they don’t appear to be sold with ballistic outserts yet are used by a modern military force. We have not been able to determine if they are rated at a ballistic level, and all plastic lenses degrade with time and UV exposure. These two masks appear to be the most affordable, readily-available, fully-featured surplus gas masks. The 4A1 is the only mask we

I still don’t know what the fuck is happening, but I do know that we have to get him out of there ASAP. No one is coming to help us and no one is coming to save him. I run to my car—thank goodness I parked only a few blocks away. I speed around screeching cars that are doing donuts in the street. When I get back, I find people lifting my friend’s body into an already packed car. I scream and scream that he is coming with me as my friends wrest his body away from the well-intentioned strangers. We race down the street into a rabbit warren of loopy suburban streets. I know what hospital I want to go to, but it’s dark and I’m confused. Riot angels pull up next to us and ask if we need to be led to the hospital.

When we arrive at the hospital and pull my friend from the car, his shirt slides up and there it is: an entry wound with no exit wound. He is immediately transferred to a trauma hospital. Over the following days, we hear over and over the words “should have died.”

Before this, I didn’t know that I didn’t know what it meant to get shot. What getting shot means is that a bullet rips through muscle, maybe through bone, maybe destroys some organs—quite possibly some that are essential. It could destroy the left kidney or the spleen; it could collapse both lungs, clip the esophagus, fill up the inner cavities with blood as the body bleeds out internally. A bullet could end up in the heart. You could find yourself in a hospital in the middle of the night, being coaxed through a series of legal documents by a very patient and very kind cardiologist who is preparing to do a second open heart surgery on someone you love to fish out the bullet that is lodged in his heart.

Luck was on our side that night, absolutely. But we responded to the situation quickly. I found out later that many different friends had passed by, that I wasn’t the only one running for a car—I just got there first. And well-intentioned strangers were trying to evacuate my friend on their own—so many people get shot in this city that people recognized what they were looking at and how important it was to respond.

What happened to my friend hasn’t stopped me from returning to the streets, and it hasn’t stopped him or other people in my community. Because the hospital placed my friend in protective custody, only one other friend and I could be there with him. Many of my friends sought comfort in the street battles that continued to rage, glad to have an opportunity to turn their grief, fear, despair, and anger into action.

Appendix I: Personal Narratives

The following accounts may help you to visualize how you would conduct yourself in similar circumstances.

The Line between Life and Death

It is a dark and stormy night, the first night it has rained all week. People are milling around under the awning of a barbecue joint, hanging back from the police line, waiting to see what will happen. More than a few folks have guns tucked in their waistbands. Some people scuffle with the police, some break up chunks of concrete to throw at the tanks; others listen to heated arguments about whether we should go home, stop violating the curfew, and leave the fight for another day. Then, out of the blue, a lone cop car comes squealing in from behind, sirens blaring.

The crowd scatters, people panic, running in all directions, as tear gas canisters skitter across the street and flash-bang grenades explode from the police lines. Choking smoke and chaos and fear everywhere. Gunshots ring out as people fire through the crowd at the lone cruiser, which has turned around to retreat. I dive to the ground by a blue mailbox, confused and separated from my friends. A tide of people flows down the street away from the police lines, as the cops start to push the crowd forward, hoping to clear it. Swept up in the sea of people, I take perhaps twenty steps down the sidewalk before I come upon a knot of people gathered around a figure on the ground.

Time slows down. Two of my close friends are clustered around a body on the sidewalk. That body is one of my oldest and dearest friends. Someone is screaming, “He’s been shot, he’s been shot!” One of my friends is shouting for people to back up, pushing people back, when he looks up and sees me. I look from him to my friend on the ground, who has been shot in the leg. But the light is fading in his eyes as he clutches his torso and moans. Getting shot in the leg isn’t enough of an explanation as to why my friend is crashing. We’re so confused—there’s no blood, there’s no blood. What the fuck happened? Where else is he hurt? There’s no blood, just a stumbling, haunting groan from his mouth. I am a mother, I have birthed a small person into this world. I know what it sounds like at the line between life and death, and all I know in this moment of despair and confusion is that this person I love so much is straddling that line before my eyes.

have impact tested so far—and the lenses shattered easily upon light impact—but we are not sure the age of the mask, as we bought it surplus.

What the Police Use

Police use a mix-and-match array of gear because they source it from military surplus and various funding agencies. As far as we can tell, the two most common masks are the Avon C50 (though it’s possible that the federal police are using the M50 military version instead) and the MSA Advantage 1000 (or its military-grade equivalent, the MSA Millennium). The C50s are often seen equipped with the Avon mask comms unit, which gives them their distinctive mouthpiece. Witnesses have reported seeing police in Portland wearing Honeywell North full-face respirators, presumably the 7600 series.

Impromptu Masks

A bandanna, ideally wet, will filter out enough tear gear to get you out of a situation. This is better than nothing. Some sources say that because CS adheres to water, a wet bandanna will only make it worse, but others, including people who have actually been exposed to the stuff, say that the wet bandanna diminishes the number of particulates that can reach your airways. It’s possible that a wet bandanna will become saturated sooner—but it will be saturated with all the stuff that would otherwise have been in your lungs, and that’s a good thing.

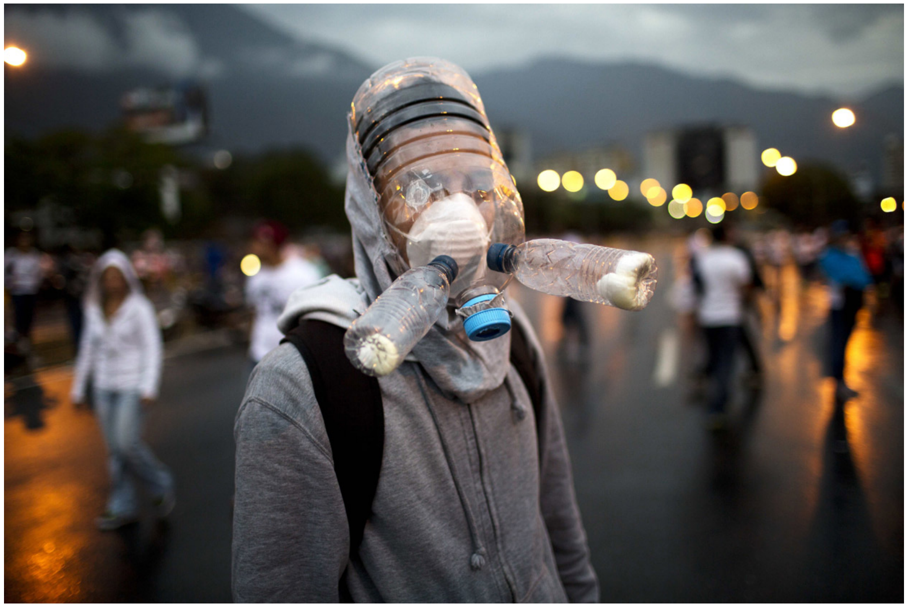
For decades, protestors have argued about whether the wet bandanna should be soaked in vinegar, lemon juice, or some other acidic solution. This has not been studied in a laboratory, and the mechanism by which it would work is not clear. However, people have been doing this for a long time, and those who practice it report noticing a difference. A 2009 Pentagon-funded report did mention that a bandanna soaked in lemon juice could mitigate the effects of tear gas.

Comrades in Portland report that some people are using the larger sneeze-guard-style facemasks common in COVID-19 protection and pulling their hoods up, probably with the drawstrings brought in tight around the face. Of course, this is not a perfect seal. One user reported that it delayed the effects of tear gas until after many unmasked people had been compelled to leave the area, that it made it difficult to talk with people, and that the facemask was too large to easily conceal on the way to and from the demonstration.

Do-It-Yourself Masks

It’s possible to make DIY gas masks. While we have not tested them ourselves, YouTubers have, and report some success. The idea is to fashion DIY filters out of activated charcoal (to filter organic vapors) and cotton (to filter particulates). These can be attached to anything from repurposed two-liter bottles to SCBA masks. If anyone has experience testing these, please let us know.

Of course, a poorly-made mask might be worse than useless.



An improvised mask.

A Final Note on Masks

In most situations, you don’t need a perfect gas mask to participate in a protest. Even if you are gassed, often all you need is something that can protect you long enough for you to get to the gas canister and deactivate it or throw it back. You don’t need to have all the right gear to go out and try to change the world.

To put it differently: changing the world is never going to be completely safe. No mask will make it safe.

Wearing a respirator can be uncomfortable, particularly in the heat, as sweat rolls down your face and the mask digs into your nose. Tight straps can give you a

hide from them until they reach each of us in isolation. Generalizing care and aid is an essential part of staying safer in the streets, which, in turn, is part of creating safer communities and, ultimately, a safer world for all of us.

As frightening as this situation is, you are not alone. The same dynamics that are destabilizing our lives and our society offer us the opportunity to connect with each other and reinvent our lives on a new basis. Thank you for everything you have done to become part of the momentum towards a better world.

On May 15, 1970, policemen in riot gear fired more than a hundred and fifty rounds in twenty-eight seconds, murdering two young Black men at Jackson State campus in Mississippi and injuring a dozen more. While the murders at Kent State a few days earlier remain widely known, the subsequent murders of young Black demonstrators in Jackson and Augusta, Georgia are often forgotten.

There has been a longstanding tendency in anarchist milieus to emulate tough attitudes and bravado. Analyzing and overcoming these cultural norms and eschewing a dichotomy between “passivity” and “militancy” can help us to build sustainable long-term movements. Remember, we want a thoroughgoing social revolution, not just periodic street violence.

In the Context of a Long-Term Struggle for Liberation

There is a long history of state-sanctioned violence in the United States, against both ordinary people and movements for social change. Alongside this extends an equally long history of extra-state violence, from the lynchings of the not-so-distant past to contemporary equivalents like the murders of Trayvon Martin and Ahmaud Arbery. Since before the American Revolution, extra-state forces have worked in tandem with the state to uphold patriarchal white supremacy. It is well documented that police continue to cooperate with white supremacists. They are two sides of the same coin.

The current clashes between white supremacists and anti-fascists are reminiscent of the rise of Nazism in Germany. In the early 1930s, when the Reichstag election campaigns were in full swing, fascists repeatedly baited their adversaries into street fights, injuring many while framing themselves as “victims in a lawless country.” They used this violence to bolster their campaign for “law and order,” a pretext to impose a dictatorship. Sound familiar?

There have now been many instances of lethal violence during demonstrations, including the murders of Heather Heyer in Charlottesville, David McAtee in Louisville, Garrett Foster in Austin, and Anthony Huber and Joseph Rosenbaum in Kenosha. It is vital that we learn how to navigate these increasingly violent and contested spaces. If we are to sustain a culture of resistance, we’ll have to be prepared to respond to a wide array of scenarios. We can learn to deal with violence and mitigate its effects while refusing to glorify or romanticize it.

As social conflict deepens, more and more people are becoming familiar with the violence that the state has long meted out overseas and against Black and Indigenous communities inside the United States. This must not deter us from action—it is better for us to confront these threats together, head on, than to try to

headache. Some masks limit your vision or your ability to communicate. Respirators make you more identifiable: even if everyone is wearing a mask, they might not be wearing the same kind of mask you are.

But the long-term effects of tear gas can be significant, so it’s important to be protected. We don’t need more martyrs—we need more people who can continue to live and fight.

In some places and times, the police use a lot of tear gas and other chemical weapons. In other places and times, they use kettling tactics or impact munitions. As with all decisions about what you need to be safe and effective, consider the specifics of your terrain.

It may be necessary to protect your eyes against projectiles as well as gas.

Protecting Your Eyes

It’s also important to protect our eyes— both from chemical weapons and from impact munitions. This generally involves an impact-rated full-face respirator or a pair of goggles paired with a half-mask respirator. The goggles should be rated for ballistic impact (or at least impact resistant), fully sealed (without open-cell foam), and anti-fog. Unfortunately, all three of these aspects work against each other; it is rare to find goggles that meet all of these requirements at once. In some cases, you might have to seal up the vents on your goggles yourself.

We've heard a few other suggestions worth considering, such as wearing a ballistic-rated visor attached to a tactical helmet over regular, non-ballistic sealed goggles. Demonstrators have sometimes worn masks from baseball and other sports, but many of the projectiles police use can fit through the wide grating such masks employ.

For Those Who Wear Glasses

If you wear corrective lenses, do not wear contacts into a situation in which you might be exposed to chemical weapons. Wear glasses. Some who prefer to wear corrective lenses but don't absolutely need them have found it simplest to take their glasses off when it's time to put on their ballistic and/or chemical-proof goggles. Others don't have that choice. There are options available for those who wear glasses, though this consideration does limit your choices and increase the cost of eye protection.

There are OTG (over-the-glasses) goggles, but we have yet to find a pair that seals adequately. Most use foam sealing, which is not airtight. Some comrades we've heard from just accept that their goggles will not be perfectly tight.

Most prescription goggles, including those made by sportsRX, are not ballistic-rated. We've found only one model of ballistic prescription goggle—the Wiley X SG-1. It's unclear how much of a seal they establish around the eyes, however, and they are nearly $300 a pair. There are probably better options.

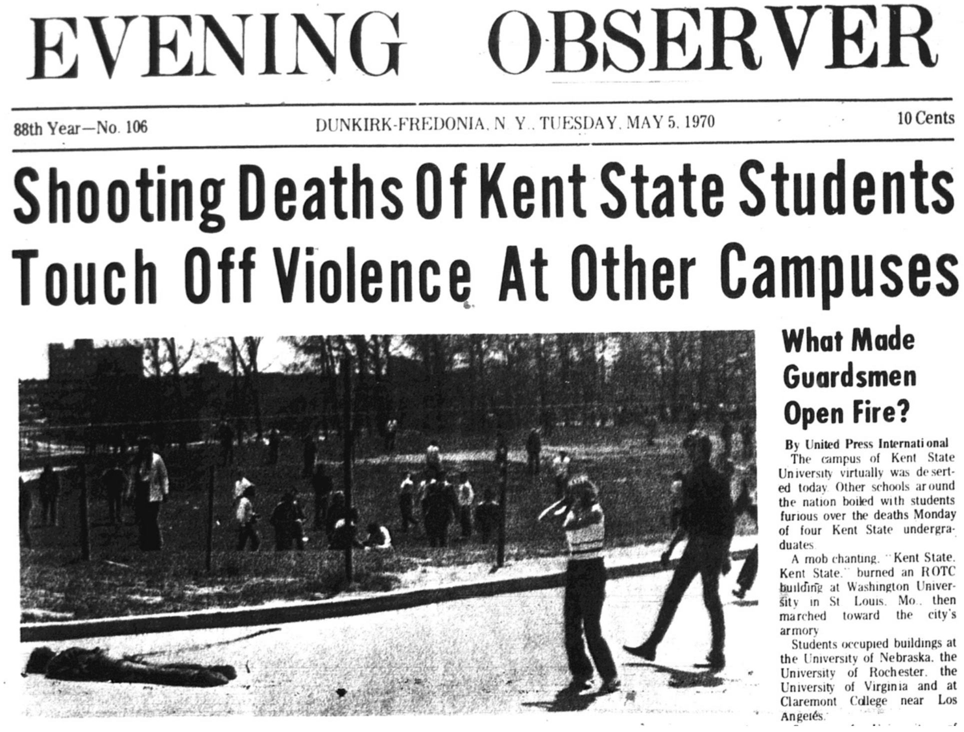
Many cheaper ballistic glasses, including the Pyramex V2G, can be outfitted with prescription inserts. The V2G, like almost every pair of ballistic goggles we've found, are not sealed against chemical weapons, but that can likely be addressed with tape or glue, as we discuss below. Most full-face respirators can be outfitted with prescription inserts as well. Protestors have been creating their own glasses inserts in gas masks, often using tape or suction cups.

One veteran told us that when he was in the army, when he distributed gas masks to civilians in the countries that the army was occupying, his unit told those who wore glasses to cut the stems of the glasses off just long enough to fit inside the

Trauma

While it should go without being said, being shot—or responding to someone getting shot, or witnessing someone getting shot, or having someone you love get shot even if you weren't there—is a traumatic event. You may experience a range of responses including nightmares, anxiety, flight/freeze/fight responses, self doubt, jumpiness, fear, and depression. Seek help! Form a community care circle and meet weekly to process the pain, confusion, and trauma.

If many people in your community were affected by the event, you can seek out a friend or loved one from outside your circle to help you process what happened. Find a therapist in your town to help you work through your feelings. While therapy can often seem cost prohibitive, there may be a non-profit, a clinic system, or a university where counselors in training can offer services for free or a reduced price. If there are ongoing protests in your city, local non-profits may offer counseling specifically for those affected. This guide written in response to the COVID-19 pandemic offers some tools you can apply to coping with trauma.



EVENING OBSERVER

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Shooting Deaths Of Kent State Students Touch Off Violence At Other Campuses

What Made Guardsmen Open Fire?

By United Press International

The campus of Kent State University virtually was deserted today. Other schools around the nation boiled with students furious over the deaths Monday of four Kent State undergraduates.

A mob chanting, "Kent State, Kent State," burned an ROTC building at Washington University in St. Louis, Mo., then marched toward the city's armory.

Students occupied buildings at the University of Nebraska, the University of Rochester, the University of Virginia and at Claremont College near Los Angeles.

At the Hospital

In some cities, hospitals place shooting victims in protective custody to eliminate the threat of violence against them.[8] If that occurs, you will not be able to locate your friend inside the hospital system. If the person is unconscious and unable to tell healthcare workers who to contact, the workers will try to contact a family member. If you are entering a situation in which it is possible that you will be severely injured, you could write an emergency number in sharpie on your skin with the instruction “call in case of emergency.”

While this may not be uppermost in your thoughts in the event of a shooting, it is important to know that most large hospital systems offer programs via which you can apply for aid to reduce or forgive your bills. If someone’s life is on the line, you can work out the financial details later.

Back at Home

When bringing someone home from the hospital, evaluate their home situation. Do they live alone? With friends or family? Is their bedroom up a flight of stairs? Depending on the severity of the injury and the forecasted length of their recovery, they may need to change their living situation.

Because there is very little semblance of a public health system in this country, people are often released from the hospital very rapidly—sometimes before they are ready to go home. This can be intimidating, but the good news is that home is usually a better recovery environment than an institution. You can rent a hospital bed from a hospital or home-care equipment rental company—they are surprisingly inexpensive and can be enormously helpful in the case of a long-term recovery.

If necessary, organize community care so people are present or available around the clock. Even if that is not necessary, try to organize a caregiver schedule involving a rotating cast of friends and loved ones to ensure that care does not fall solely or mostly on a partner. In addition, you can create a meal schedule for people to drop off food and groceries or cook for the wounded and the caregivers.

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[8] In this case, if someone has been shot, the hospital assumes that they may still be a target and aims to reduce the possibility of continued harm.

rubber gasket of the mask (or goggles) and then glue them into place. Hot glue might work. We’ll experiment and edit this text with our findings.

Pyramex V2G Plus goggles.

Another style of “universal” prescription insert is a glasses frame with the stems bent down to fit inside the seal of the gas mask.

Prescription inserts can be filled by taking them to an optometrist or by mailing them to some places online.

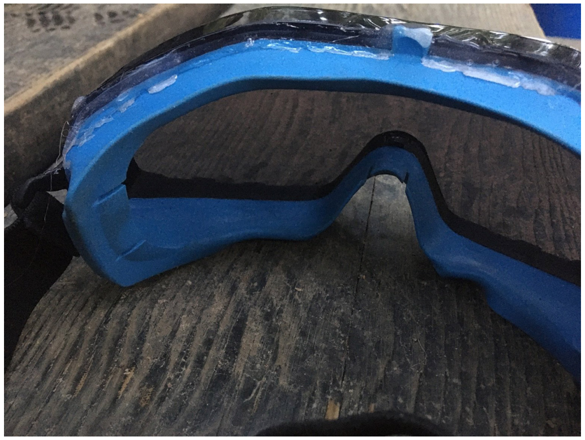
Sealed Eyewear

Goggles come in three major classes: fully-vented, indirectly vented, and non-vented (sometimes called “sealed”). Fully-vented goggles offer the best protection from fog; they are used for a lot of sports. For most purposes, indirectly-vented goggles offer the best of both worlds: the vents allow enough air in to keep the goggles from fogging, yet the vents are inaccessible enough that they are reasonably safe from chemical splashes and things like sawdust. Unfortunately, they let in tear gas, so they’re not ideal for protests. You want fully sealed goggles. Sealed goggles rely solely on chemical treatments and the thermo-conductive properties of the lenses to fight fog, which are not always sufficient.

Be careful: sometimes goggles are listed as “sealed” yet use an open-cell foam for their seal, with the idea that the foam itself vents air to the inside. Open-celled foam is a bad idea for situations involving police repression because it absorbs chemicals. The other two means by which goggles form a seal against your face are rubber and close-celled foam. We have not tested the practical difference between those two methods. Our speculation is that rubber seals, like the seals on gas masks, offer better protection against chemical weapons and would get less contaminated, while closed cell foam might protect against the problem of suction.

What problem of suction? The idea is that, if goggles are attached to your face in a sealed manner (especially through suction, like swim goggles), if something hits those goggles, first, positive pressure might damage your eye, then, if air escapes, negative pressure could also damage your eye. Worst-case scenario, this could permanently blind you. We’ve looked into this a little bit, and talked to an anarchist doctor, and the general consensus regarding whether this is a real risk is… "maybe." Some studies have shown swim goggles causing bruising and some eye damage, and it seems likely—though we have not confirmed this—that this explains why swim goggles are not permitted in full-contact water sports like water polo. It's also possible this is why we've had such a hard time finding fully-sealed ballistic goggles available for sale. Of course, as the aforementioned doctor pointed out, if you get shot in the eye with a projectile, it's better to have the problem of suction than the problem of the projectile hitting your eye. Also, we have yet to find any evidence of ballistic impact causing problems with suction.

We speculate that some do-it-yourself methods of sealing vented goggles could mitigate the dangers of suction, as the DIY sealing would likely fail upon impact, normalizing the air pressure. If this is true, DIY sealed goggles could be safer than fully-sealed goggles.


Goggles sealed with hot glue.

Protestors have been employing at least two strategies to seal the vents on vented goggles—hot glue and duct tape (ideally applied to both the inside and outside of the vents). Hot glue is far preferable, as most tape loses adhesiveness as it gets wet. Fabric-based tapes do not seem to provide enough of a seal, while plastic-backed tapes trap moisture, which loosens the glue, causing it to fall off. Use tape only in an emergency. Even hot glue can sometimes work itself loose.

We haven't tested other glues or epoxies. There are likely additional methods besides hot glue and tape.

Ballistics

Unfortunately, in addition to spraying us with chemicals, the police also shoot impact munitions at us. While every impact munition in production is specifically

A small IFAK that can be worn on a belt, marked with a cross for easy identification.

Evacuation

Know your options for evacuation. Are you behind a police line that an ambulance cannot pass through? Does the local medic collective offer transport to hospitals? You can try calling for an ambulance if you think you are in an area they can enter. When you place a 911 call for an ambulance, you can request that they do not send police in tandem, but they may well ignore your request. If you do decide to call EMS while you are in a group actively trying to assist someone who has been wounded, designate one person to make the 911 call and report the wound and location while the rest of you stay focused on assisting the victim. It is possible—but not guaranteed—that a 911 dispatcher can walk you through basic trauma response until you receive help or can transport the wounded.

If you or your comrades have driven to the demonstration, it can help if a car is parked nearby with immediate access to the road. Make sure the location of the keys is known and accessible to more than one person. Other people will likely wish to assist in the event of a shooting. If you cannot transport the patient yourself, seek aid from those around you.

point. If the wound is in the leg, consider applying pressure in the upper thigh, near the pelvic region—but be careful. If there is a wound in this area, try applying pressure in the lower right abdomen. If the wound is in the arm, try applying pressure underneath the armpit. If the bleeding is on the neck, try applying pressure on the side of the neck generally underneath the point of the jawline, keeping in mind to apply pressure only on one side. Only do this in an extreme emergency, as it is of limited value for bleed control.

Regardless of where the wound is, once you apply pressure, do not remove pressure to check if the wound is still bleeding. Continue to apply pressure until a medic can place a pressure dressing or other hemostatic intervention.

If the wound is in the chest, it is acceptable to cover the wound with your gloved hand, but applying too much pressure can potentially inhibit their respiratory system. Chest wounds generally present with less bleeding, but run a high risk of air entering the chest cavity, leading to a buildup of pressure that can cause a lung to collapse. Some medics carry vented chest seals in their kits, which serve the same general purpose as a gloved hand over the wound: preventing air from entering the chest cavity. If the wound is in the trunk—i.e., between the chest and the navel—there is probably little you can do to help besides notifying a medic or other higher care immediately.

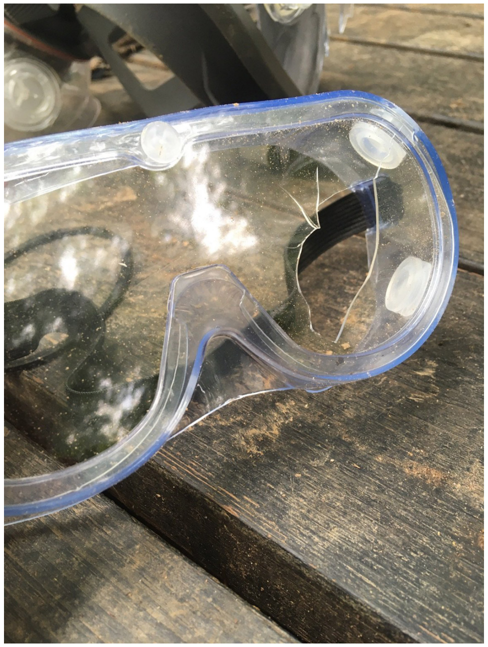
If you can control the bleed, you or a friend should prepare the victim for a possible ER visit or another situation in which they may have their possessions confiscated. Remove any potentially incriminating items from their backpack, pockets, and person. Dispose of these or give them to a trusted friend who can remove them from the scene.

When higher care arrives, whether that is EMS or street medics, give them a report to the best of your ability, using the MIST acronym: the Mechanism of injury (M), the Injuries sustained (I), the Symptoms (S), and any Treatments (T) given. For example, “They were shot with a rifle from about two blocks away, they received two bullet wounds in their left leg. Their skin is cool to the touch, and their breathing seems slower than normal. I applied a tourniquet high and tight and the bleeding seems to have stopped.”

If it takes a while for medical care to arrive, consider writing symptoms or other things you notice on the patient’s arm with your marker.

designated not to be shot at anyone’s face, police officers routinely shoot them at our faces. Police have inflicted severe eye injuries on dozens of people in the US in 2020 alone, and many of the victims have permanently lost their vision. Some of them were wearing safety glasses when they were hit, too.

It’s probably safest to find eye protection that is rated to offer “ballistic” protection, rather than simply the “impact resistance” designed to mitigate workplace hazards. While this limits your selection of available glasses, goggles, and gas masks, ballistic-lensed eyewear can still be found cheap if you know where to look. Admittedly, in our experience testing different styles of goggles against various impacts, we have yet to find any noticeable difference between the performance of those that are rated only to the civilian impact resistance rating (ANSI Z87.1+) and those that are rated against the higher standard mil-spec (PRF-31013). We also obtained the same results testing one pair that was unrated but was advertised as “shatterproof.” While our experiments are ongoing, our current hypothesis that most shatterproof, impact resistant, and ballistic plastic lenses are constructed in the same way. Still, the higher testing standard also tests whether the entire goggle stays together during impact, even if it breaks.

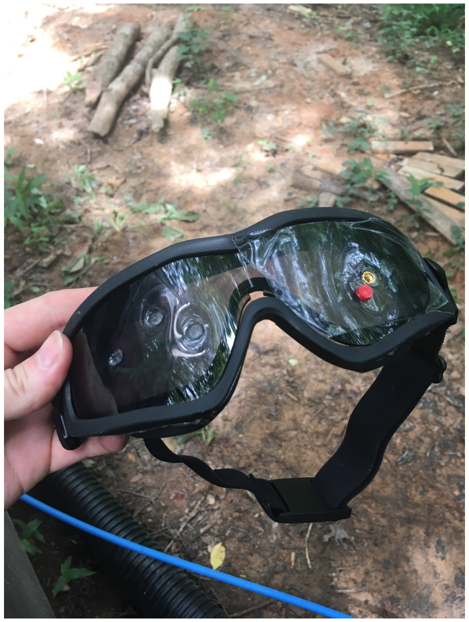


Regular lab goggles shattered when shot with a BB.

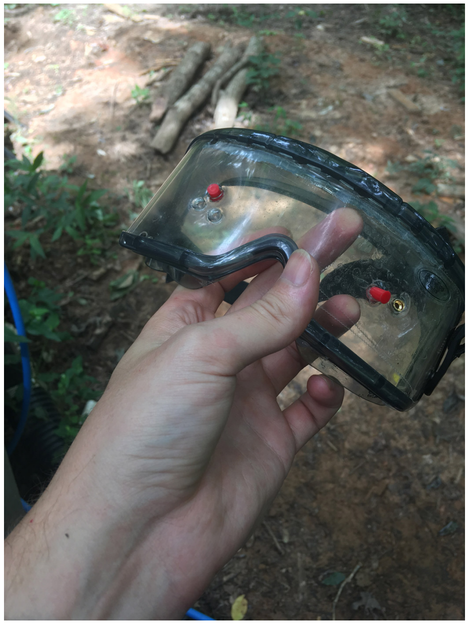
In any case, some level of impact resistance is vital. Anecdotally, we spoke with a protestor in Puerto Rico whose eye was saved when a large splinter of wood embedded itself in their ballistic goggles after police munitions shattered a nearby tree. While ballistic goggles are not rated to take direct fire from firearms—and we cannot promise that they will protect you from every possible impact munition—their rating exceeds the force projected by pepper balls or even baton rounds. On YouTube, you can see people shoot ballistic goggles with birdshot from a shotgun without breaking the goggles.

We tested unrated lab safety goggles for comparison. They shattered dangerously at impacts that didn’t even dent shatterproof lenses.

Some people have been using clear tape to reinforce their goggles and gas masks, hoping that if a munition breaks the plastic, the tape might keep the pieces from splintering dangerously, a premise based on the way automobile glass breaks. To test this theory, we taped just one lens on several pairs of goggles and one respirator with Gorilla tape—the strongest clear tape we could find—and shot them with pellets. The areas that were taped had worse penetration, presumably because the tape trapped the pellet and prevented it from bouncing away. Yet pellets are not a particularly realistic threat at demonstrations. So we shot a few with rubber pellets from a 12-gauge shotgun. One shattered, but more safely than those that were untaped, while one did not shatter at all when we fully expected that it would. This is not conclusive research, but it’s possible that tape might help.



Ballistic rated goggles. The side on the wearer's left was laminated in Gorilla tape.



ANSI-rated goggles after impact testing. The side on the wearer's left was laminated in Gorilla tape.

Impact Standards

The plastic (usually polycarbonate) lenses of respirators, goggles, and glasses are rated to various standards of impact resistance. In the US, civilian goggles can be

This process will hurt your comrade immensely, though likely less than the initial wound, depending on its location. Talk to them while you are applying the tourniquet and afterwards as you are able.

Prior to ever using a tourniquet, you should get a sense of how tight it has to be to be effective. Try placing it on yourself briefly just above the elbow before the demonstration and tightening it until you no longer feel the pulse at your wrist. This is a good exercise in empathy, to know what kind of experience a person you treat will endure. Never leave a tourniquet in place for more than a few seconds except when treating an actual wound.

As soon as you have stopped the bleeding—by using direct pressure, a pressure dressing, or a tourniquet—immediately being to look for other wounds. Sweep underneath all parts of the body with gloved hands. Check your hands for blood regularly during the sweep so you can immediately identify which part of the body is injured. If the injured person is wearing waterproof clothing, make sure to remove or sweep inside of those layers, as a rain jacket or rain pants can keep blood next to the body, concealing a major bleed. *Do not wait to apply a tourniquet if you find a major bleed on an arm or leg. Pause the sweep, apply direct pressure, a pressure dressing, or a tourniquet, and resume sweeping once that bleed is controlled.*

Bleeds that are in junctional areas (i.e., the groin proximal to the inguinal ligament, the buttocks, the gluteal and pelvic areas, the area under where the arm connects to the shoulder, the shoulder girdle, and the base of the neck) can be controlled by “packing” the wound, which applies direct pressure to the severed artery or vein. If you are in an unsafe area, or if you are not equipped with wound packing material, direct pressure on the wound, ideally with a gauze pad, can do for the time being.

If you are not equipped with an IFAK or tourniquet, call loudly for a medic. Call out landmarks to guide them quickly to you, as well as crucial information such as whether the casualty is bleeding considerably: for example, “I need a medic! I’m behind the red sedan—someone has been shot in the leg!”

While you wait for them to arrive, use direct pressure to slow the bleeding. If the bleed is capillary (slow and even flow, bright red in color) or venous (steady flow, dark red in color), you may be able to control the bleed with direct pressure. If the bleed is arterial (spurting or pulsing flow, bright red in color), direct pressure won’t be enough—you will have to apply pressure at an arterial pressure sterile absorption pad over the wound, and over any gauze that has already been applied (never remove gauze—this could disrupt any clotting that may have started). Wrap the elastic bandage firmly around the injured part of the body. It should apply a lot of pressure, but not enough to cut off circulation.

With a life-threatening bleed, time is of the essence. If the wound is clearly on an arm or a leg and you can see a lot of blood, you may choose to apply a tourniquet immediately. Unlike holding direct pressure with gauze or using a pressure dressing, which stops bleeding from a specific wound, a tourniquet cuts off all distal circulation to the limb, meaning that it should stop all bleeding that is further away from center body than where the tourniquet has been applied. If applying a tourniquet over clothes, quickly check to ensure that you are not fitting it over items in a pocket or anything else that could obstruct the pressure.

Many people have been taught that using a tourniquet is likely to result in the loss of the patient’s limb, due to complications from cutting off circulation; in fact, this is still commonly taught within many wilderness/remote medicine and street medic frameworks. Data garnered from combat zones across the globe, however, has shifted the understanding of tourniquet safety. Certified tourniquets such as the CAT-7 are now understood to be highly effective and safe live-saving devices, rarely resulting in long-term damage or side effects. Used correctly, they are considered an appropriate first line of intervention, rather than solely as a “last resort.” As the everyday demonstrator’s threat model changes—especially if the streets increasingly take on the contours of a combat zone—models of intervention based on armed conflict scenarios, such as the Tactical Combat Casualty Care framework, will gain increasing relevance.

For a succinct step-by-step guide to using a tourniquet, see Appendix III.

To apply a tourniquet, open your CAT-7 and make sure that the band is passed through the single routing buckle and the red tip is pointed towards the heart. Then slide the tourniquet up the extremity as high as you can possibly go, while taking the individual’s genitals into consideration if applicable. If the wound is clearly below the knee or elbow, and you can easily see there are no wounds higher on that limb, you can place the tourniquet just above those joints. Once you have it in position, make sure the strap is as tight as you can make it—think “ratchet strap.” If you can stick even one of your fingers beneath the strap, it is not tight enough. Turn the windlass until the flow of blood stops. Pull the “strap” closed through the windlass clip and mark the time applied on the time strap.

rated to the ANSI Z87.1+ standard, while military and tactical gear is rated to MIL-PRF-31013 or another MIL ballistic standard; in Europe, EN168A (or, slightly less great, EN168B). Presumably, there are comparable standards in other parts of the world.

Impact standards are generally established by shooting a small steel BB at the glasses, goggles, protective visor, or gas mask at various rates of speed. To qualify for the standard, the lenses must not break or detach from the frame. Most “ballistic” ratings require the lens to survive projectiles striking at a velocity of at least 500 feet per second (fps). The main “impact resistant” standard, ANSI Z87.1+, is only 150 fps. We shot goggles at 630 and 840 fps and found no difference between the two standards.

Some manufacturers brag about the standards they meet on their sales pages, but failing that, it can be a lot of work to work out what gear is rated for ballistic impact, especially regarding older equipment like surplus masks. Fortunately, ANSI rated gear has Z87.1+ stamped somewhere onto the frame.

We cannot say for certain which standards are necessary to protect against which particular threats, because these standards were designed with workplace hazards (in civilian models) and shrapnel (in military models) in mind, not impact munitions. We spoke with engineers who suggested that testing is more important than the application of abstract math, since the angle of impact, distance, wear and tear on the plastic, and shape of the visor are all significant factors in determining what will and won’t break a specific piece of plastic. Regardless, wearing impact-resistant eye protection will greatly reduce potential damage to your eye, face, or skull, even if it does break on impact.

Anti-Fog

Glasses and goggles fog up, particular in humid environments. Foggy goggles are annoying—and in a protest situation, potentially dangerous. Manufacturers (and protesters) employ three basic anti-fog measures.

First, and most effective, is airflow. Full-face respirators that are designed to fight fog direct fresh air across the visor before you breath it in, while ensuring that exhaled air escapes the valve immediately. Vented goggles—which we don’t use—also rely on fresh air to fight fog. Sealed goggles present a disadvantage.

The second most effective anti-fog measure is to use “thermal lenses” or “dual lenses.” These goggles employ a dual pane system of lenses with an air gap in between, creating a thermal break (insulation, essentially) that reduces condensation on the lenses.

Finally, the most common anti-fog measure is a hydrophobic surface on the inside of the goggles. Most goggles that say they are “anti-fog” use this method, which consists of a thin layer of oil over the inside of the lens. Oil is hydrophobic, so moisture beads up and falls. The chief weakness of most of these anti-fog coatings is that they eventually wear out, especially if the lenses are washed with soap. Some manufacturers claim that their anti-fog coatings are chemically bonded to the plastic and do not degrade, but we have yet to test their claims ourselves.

One researcher for this article lives in a region where humidity hovers around 80-90% all summer. In these conditions, relying on a regular hydrophobic anti-fog coating is far from adequate, even when using vented goggles; the goggles fog up very quickly. By contrast, indirectly vented thermal goggles can be worn for hours without fogging up. The difference between the two methods is significant.

Anti-fog sprays are available and reasonably cheap, though DIY solutions are just as common. Many swimmers swear by using saliva as a thin coating on the inside of their goggles to prevent fog, while others use baby shampoo (not adult shampoo, which would irritate the wearer’s eyes). We consulted an anarchist long-distance swimmer who reports that baby shampoo has been effective for hours at a time in the ocean, while saliva seems to last from 10 to 45 minutes at the very most.

Comrades in Portland have submitted the following anti-fog recipe, which we have not personally tested.

Materials: Toothpaste/baking soda, water, Dawn anti-grease dish soap, Johnson & Johnson baby shamboo, spray bottle (other brands of similar quality can be used).

If your lenses have an anti-fog coating, wash them with water and a soft rag and let dry. If your goggles *do not* come with an anti-fog coating:

- Wash your hands well.
- Use a non-whitening and non-gel toothpaste, or baking soda and water. Spread it over the entire lens and the skirt inside the goggles/mask.

Continually assess what’s going on around you. Are there still gunshots being fired? Is there traffic in the area? Are people running past you fleeing from a shooter, police, or fascists? Don’t let panic, haste, or inattentiveness cause additional misfortunes.

Immediate Treatment Options

Nothing you could read here can substitute for proper medical training. However, if you own an IFAK or tourniquet and possess a basic understanding of how to stop a bleed on an arm or leg, some action may be better than nothing.

If gunshots ring out, try not to panic. First, get to a safer place. In the system of Tactical Emergency Casualty Care, the first step is to maintain scene safety, so you do not become a casualty as well. Find cover from which to assess the situation. “Cover” designates anything that can stop the rounds you are facing, which depends on the situation and the caliber of weapon. Consider a brick wall or the engine block of a car.

If you determine that someone has been shot and you are equipped to provide aid, make sure the scene is relatively secure. If you can determine this, communicate to your friends that you intend to move to the person who has been hit. While moving, ask the person questions to determine how to care for them: “Where were you shot?” or simply, “What is your name?” If they answer these questions before you reach them, this will indicate that their airway is open and they are conscious, and you may obtain enough information to start preparing your equipment and mindset.

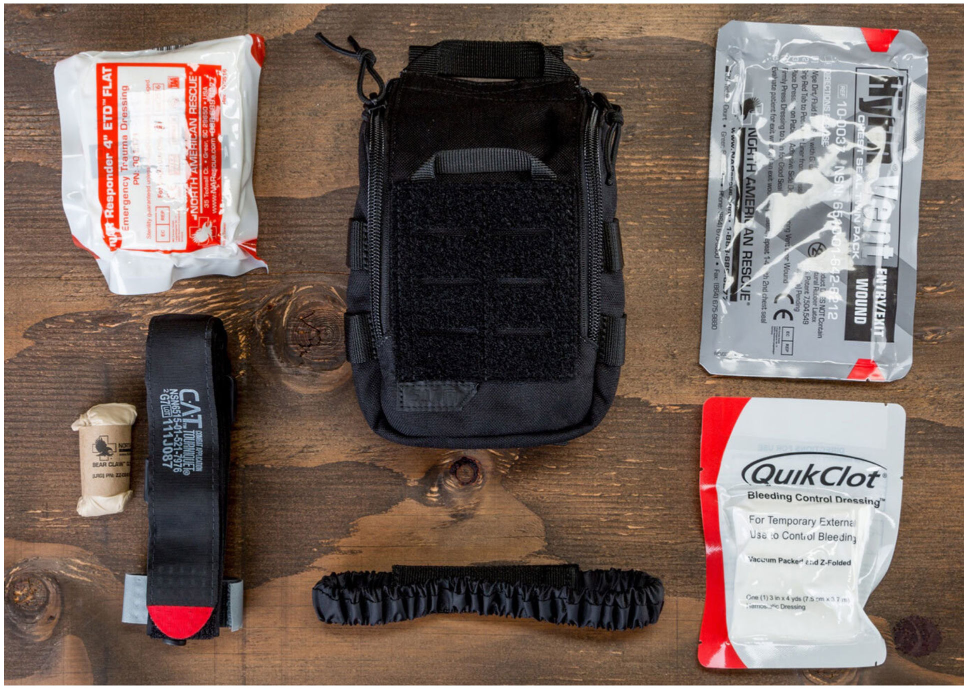
Your first thought will likely be, “That’s a lot of blood!” Initially, you may have a difficult time identifying exactly where the wound is, especially if the individual is wearing long-sleeved dark clothing. Quickly expose the injury, using trauma shears (special scissors designed to cut quickly through clothing) if you have them. In general, it is important to expose an injury at skin layer to understand the exact scope and extent of the wound.

Immediately apply direct pressure to the wound. Ideally, you would use a gloved hand and a gauze pad (preferably hemostatic gauze), but in an emergency, you can use a t-shirt, scarf, or extra mask. If blood soaks through the gauze, add more gauze or another cloth layer and apply more pressure. If holding direct pressure with your hands does not stop the bleeding, apply a pressure dressing. Place the

If a Shooting Occurs

Several things can happen in the immediate aftermath of a shooting. If police are nearby and intervene, it is possible that you will rapidly lose control of the situation. Despite their general lack of medical training, they will typically form a cordon around the victim and prevent a medic or anyone else from treating them. This does not necessarily mean they will act quickly in response to the injury. Put pressure on the police if they aren’t doing enough, or doing it fast enough. Demand they seek proper medical care for the injured.

The flip side of the scenario is just as possible—you and your comrades may have to make do without state intervention. If the situation is chaotic or deemed dangerous, even if you *are* willing to call emergency services, an ambulance may not enter an area. Police may spend an inordinate amount of time trying to clear the area with tear gas or other means before they bring in an ambulance—they might even simply prevent an ambulance from reaching you. In such a situation, depending on the severity of the wound, survival may depend on quick thinking and action. In that case, you will have no one to depend on except yourselves to care for the wounded and organize your evacuation.


Responder 4" ETD™ FLAT
Emergency Trauma Dressing
NORTH AMERICAN RESCUE
C-A-T TOURNIQUET
WOUND
ENTRY/EXIT
QuikClot
Bleeding Control Dressing
For Temporary External Use to Control Bleeding

A small Individual First Aid Kit (IFAK) containing a tourniquet and trauma dressings.

- Use your fingers or a soft-bristled brush to scrub the lens, then rinse it thoroughly with water.
- Repeat this step again if your goggles get dirty, oily, or greasy.

Next, mix your anti-fog solution:

- Use a clean spray bottle
- Fill with 40% dawn, 50% baby shampoo, and 10% warm water.
- Mix thoroughly.

Finally, treat your goggles/mask:

- Wash your hands well
- Spray solution on the inside of the mask/goggles
- Scrub lenses and frame with clean fingers
- Let sit for 30 seconds
- Rinse briefly with warm water, making sure to leave a light layer of solution on the lenses, and let it dry.
- If it stings your eyes when you put the goggles on, use less Dawn and more water in your next batch.
- Repeat before every action.

Visors

It is also possible to gain impact protection from a visor mounted to a tactical helmet. This is covered in greater detail in our guide to helmets.

Asian-Fit Goggles

Many people of Asian descent find that goggles do not contour well to their faces. Manufacturers make goggles that sit higher on the nose, labeled Asian-Fit goggles. We are currently looking for Asian-Fit goggles that meet the standards we’ve outlined, but the ballistic pairs we’ve found so far use foam as the seal. If anyone has suggestions, please let us know.

Some Common Goggles We *Don't* Recommend

Work glasses: Some work glasses with ballistic lenses also come with straps to turn them into goggles. All three of the models of this style that we've researched do not really form a seal around the eyes.

Fire goggles: Fire goggles are designed for wilderness firefighters, but tend to make use of thick open cell foam for ventilation. This is intended to filter smoke, but not tear gas.

Swim goggles: Swim goggles offer the advantage of being small and providing a good seal, so they pair well with half-mask respirators. However, it is hard to find impact-resistant swim goggles and it's worth considering the potential problem of suction.

Ski goggles: Most ski goggles use open cell foam, rather than rubber, to form a seal. As mentioned above, open cell foam can absorb chemicals

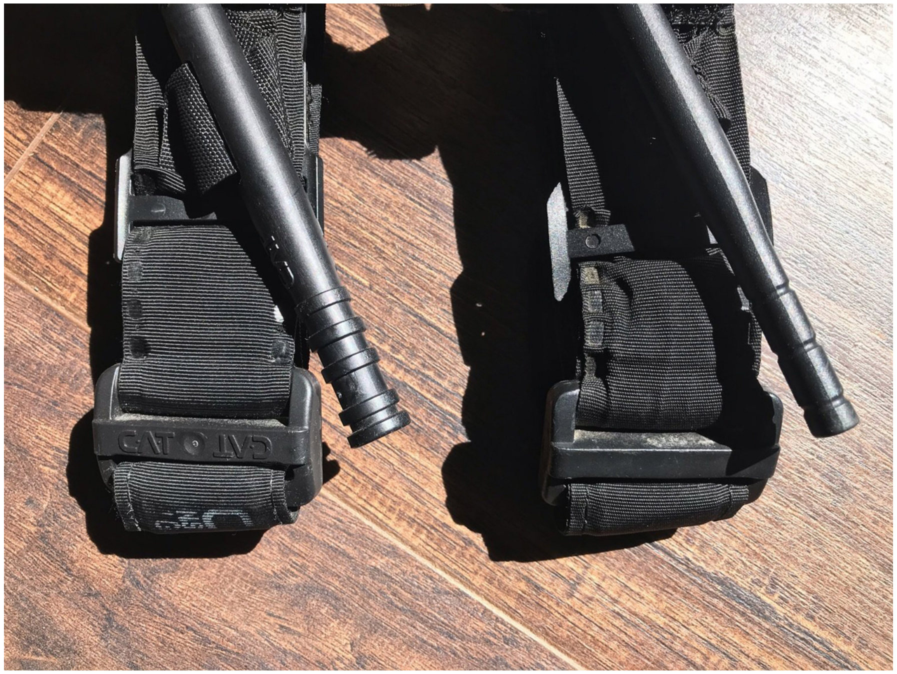
Some Specific Goggles You Could Try

None of the authors have tested the following goggles against tear gas or police munitions, though at least one of us has handled and worn each type. These recommendations are based on a mixture of research and conversation.

Our number one recommendation so far is the **Pyramex V2G Plus.** These are less than $20, ballistic rated, and use dual-lens thermal anti-fogging—one of the more reliable anti-fogging measures. There is a prescription insert available for those who wear glasses. These goggles are indirectly vented, however, so you'll have to seal them with hot glue or tape. The only potential problem is that the two-lens thermal system makes it harder to adequately seal. There is a thin layer of foam between the lenses, allowing moisture to pass through, and if you live in a humid environment, you might trap moisture between the lenses permanently.

Another option is the **Pyramex Capstone.** These goggles are less than $20 and ballistic-rated. They use regular hydrophobic anti-fogging. Like the **V2G Plus,** they are indirectly vented, so you need to seal them.

SolidWork Safety Goggles are slightly more expensive, $30 or so. They use a large rubber seal and seem more capable of sealing securely to your face. These are also indirectly vented, so you will need to seal them.



The one on the right is a cheap knockoff that could fail under pressure.

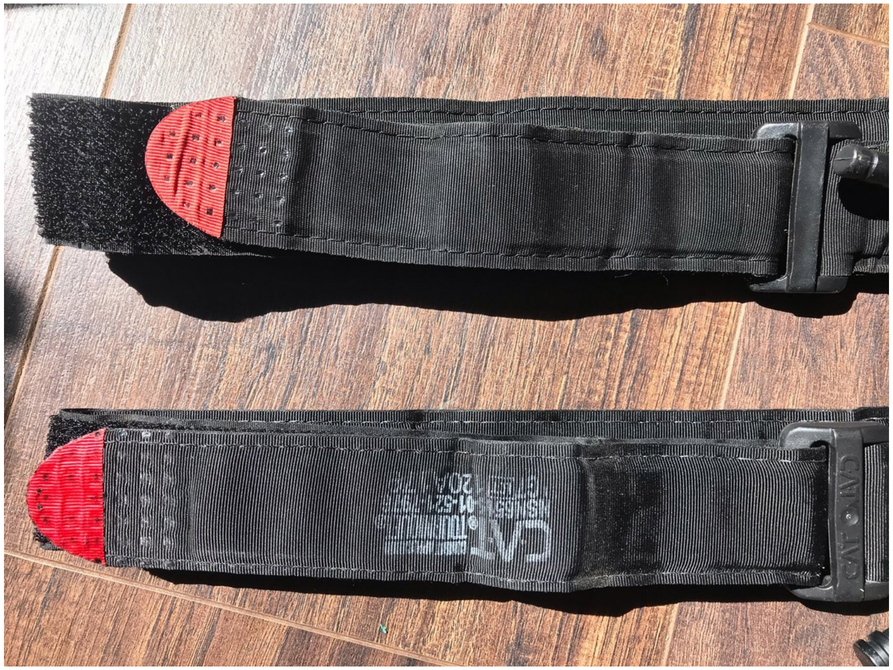
It is good practice to keep your tourniquet with the band already threaded through the buckle, creating a large loop you will then pass over the foot or hand, rather than attempting to thread the buckle in the heat of the moment if you need to use it.

Finally, carry sharpies to mark the time that a tourniquet was applied or any additional information that first responders—street medics or otherwise—may need to know. Black sharpies work for white people or lighter-skinned people of color, while silver sharpies work better for Black comrades.

Even if there is a trained and *experienced* medic collective local to you, carrying an IFAK, or even just a tourniquet, is a great idea. In the scope of emergency casualty care, many properly trained medics will seek to use the injured comrade's equipment on them first, in order to save their specialized equipment for those who did not carry anything. Because of this, be sure to mark your IFAK or blowout kit clearly and carry it somewhere that is easily accessible. Failing this, make sure to have your tourniquet easily accessible, in a marked, visible location that is known to everyone in your affinity group. Normalize the practice of letting your trusted comrades know where your medical equipment is located.

an attached non-adherent absorption pad and a Velcro or clip closure system. When holding pressure on the wound with your hands is not enough stop the bleed, a pressure bandage is used to apply stronger, constant pressure to a wound. There are many different models of pressure dressings; if you carry one, make sure you know exactly how it works. Online training or gear review videos are great for this.

A tourniquet is the cornerstone of an IFAK. If you carry only one intervention tool, invest in a quality tourniquet. When purchasing a tourniquet, it is ideal to acquire one approved by the Committee of Tactical Combat Casualty Care. These tourniquets have undergone rigorous pre-manufacturing testing and have been thoroughly vetted through field use. We recommend a CAT-7 Tourniquet. One can cost around $35; you and your comrades may be able to buy them in bulk to save money. Beware of fakes! Many cheaper versions are in circulation; these can fail under pressure. You can usually recognize a fake by the absence of a factory stamp by the red pull tab; a skinny windlass (i.e., the rotating rod) can also be a giveaway, instead of a beefier one with extrusions. Finally, and most obviously, no black CATs produced before 2009 have white “time” straps. Fakes notoriously have these white straps.



The one on the top is a cheap knockoff that could fail under pressure.

There are many, many more goggles that can work, and something is almost always better than nothing.

Workarounds

One person we spoke with wears swim goggles under vented ballistic goggles. The swim goggles provide a good seal despite being paired with a half-mask respirator. This approach could also work for those who own prescription swim goggles or are willing to buy a pair. It’s more to carry, it’s presumably uncomfortable, and we have not yet received word from this person as to how it has served in the thick of chemical weapons. If anyone else has experience with this method, please let us know.

A Demonstrator’s Guide to Body Armor

Protecting Yourself against Blows, Batons, Bullets, and More

Over the past four years, police and fascist violence against demonstrators has escalated around the United States, with well over a dozen demonstrators murdered in 2020 alone. This is not the consequence of Trump’s presidency, but the result of intensifying social pressures that will not be relieved by another politician taking office. Unfortunately, ceding the streets to fascists and police will ultimately only increase the dangers to all of us. By taking the proper precautions, we can mitigate the risks while continuing to take action to build a better world. This guide reviews a wide range of protective gear, exploring the advantages and disadvantages of each so you can pick out what’s best for you. The life you save could be your own.

We’re going to focus on three styles of armor: sports armor, for mitigating impact weapons like bean bag rounds and batons; soft ballistic armor, or “bulletproof vests,” which defend against handguns; and plate carriers, which are designed to protect your vital organs from rifle fire.

Our threat models—the risks we are seeking to protect against—are changing constantly. A few years ago, protest armor was intended to protect against Nazis with knives and sticks. At the beginning of the George Floyd uprising in the US, the chief threat model involved police using various impact weapons. By the end of summer 2020, police were still shooting baton rounds and pepper-balls, but fascists shooting live ammunition had become a more pressing issue.

All armor involves pros and cons. Most armor reduces mobility, which is one of our primary advantages against police who are weighed down by both bureaucratic command structures and heavy gear. Most armor makes us stand out, rendering arrival and departure more difficult. Some armor incurs the risk of

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Before the Demonstration

Before going to a demonstration, assess the security and health needs of your comrades—including ability and willingness to call for emergency services, which are usually accompanied by police. Are there any needs that should be addressed before someone reaches the emergency room? Who would you like your friends to contact first in the event of an emergency or injury?

In addition to learning whether trained medics will be around, make sure you know the location of the nearest emergency room—preferably one with a trauma center. Not all hospitals are equipped to deal with life-threatening wounds. If you will not be near a hospital with a trauma center, at least learn the location of the nearest hospital. With any luck, they should be able to stabilize a victim before transferring them to a hospital that is prepared to deal with mass physical trauma.

Equipment

There are several items you can carry with you that can be useful in the event of a shooting. Consider procuring or building an Individual First Aid Kit (IFAK) to carry with you. An IFAK is a trauma kit containing essential life-saving materials to help you control bleeding and treat major wounds. It is usually a small pouch containing items such as a gauze (regular or hemostatic), pressure dressing, personal protective equipment (gloves, face shield), and a tourniquet. An experienced medic has compiled a thorough list of what to put in an IFAK and where to obtain it, which is included in an appendix below. With the exception of PPE, which protects you and the person you are assisting from blood-borne pathogens or other communicable diseases, all of these intervention tools share the same purpose: to stop bleeding as quickly as possible.

Gauze is a basic part of an IFAK, but a crucial one. It is used to absorb blood as you apply direct pressure to a wound. It can also be used to “pack” inside of a larger wound.[7] Hemostatic gauze (often known by brand names such as QuickClot, Celox, and Hemcon) is gauze impregnated with a mineral agent that helps blood clot more quickly, which is critical in the case of a major bleed.

A pressure dressing (also referred to as an Israeli bandage, emergency bandage, or emergency trauma dressing) is an elastic wrap, similar to an ace bandage, with

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[7] “Packing” means applying internal direct pressure to a severed vessel by creating pressure on that vessel with gauze, filling the wound with more gauze, holding direct pressure when the wound is filled, and finishing it with a pressure dressing.

Street Medics

Depending on the type of event and where it is taking place, there may be medics around. You could investigate in advance whether there are street medics in your area, whether they will be attending, and where they will be positioned. During demonstrations, one often sees medics milling around in the crowd or stationed at the margins, carrying gear and wearing a red cross or a similar insignia identifying them as medics. If you believe it could become relevant, you can ask them whether they are prepared to deal with gunshot wounds and other severe injuries. Many medics have experience responding to tear gas, pepper spray, and rubber bullets, as well as exhaustion, dehydration, and panic. Currently, it is less likely that a medic who responds to a gunshot wound will possess the relevant skills and experience.

If you are assessing the extent to which local medics are trained to deal with gunshot wounds and you learn that they are prepared to offer “first response” care, you can also inquire as to whether they have the capacity to offer prolonged care in the event that EMS services cannot reach an area. This can give you vital information about the potential risks you may be taking on if you remain in an escalating situation.

Street medics in the Bush era.

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legal penalties. Being the only person wearing armor is often a bad idea unless it can be concealed. Still, normalizing wearing armor can make it easier for others to do so, and the more people do, the safer we all will be—both from direct attacks and from police efforts to target us for protecting our bodies.

Which kind of armor is appropriate will vary from one situation to the next. In many situations—for example, when speed or optics is paramount—it may still be best not to wear armor.

Armor can easily give the wearer a false sense of security. Shortly before we published this, there was yet another incident in which a fascist shot a counter-protester; the survivor was wearing body armor, but the bullet entered their body at a point that was unprotected. No one is invincible, no matter what they wear.

Executive Summary

If you want to protect yourself primarily against batons and other police impact weapons, get a skateboard helmet, some hard-shelled knee pads, some children’s shin guards to wear on your forearms, and possibly motocross chest armor or a plastic fencing breastplate. If you want to add more protection, consider a shield, full leg armor, and a HEMA gorget—plastic or padded neck armor for people who fight with swords for sport. A guide to shields will appear later in this series.

If you want to wear something that protects you against handguns, get a wraparound IIIA vest, either from the leftist armorer Red Star Defense or from eBay. If you are buying from eBay, consider purchasing a surplus vest to save money. If you’re worried about knives, pay a bit more for a vest with stab resistance.

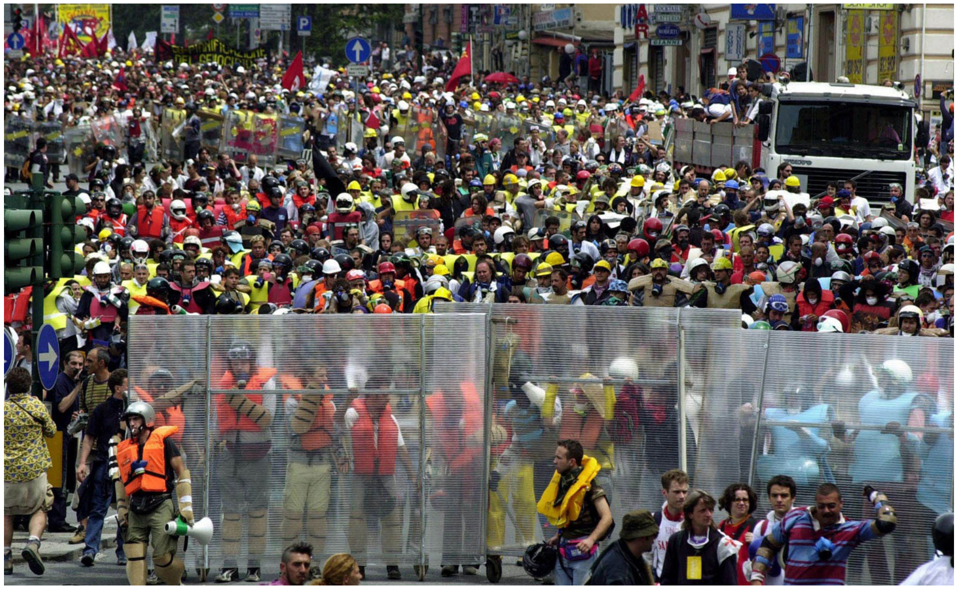
If you want to protect yourself from rifle rounds, get a plate carrier and a pair of III+ ceramic plates from Red Star Defense or elsewhere. This is heavy and harder to conceal.

The Old Days: The *Tute Bianche* and the Padded Bloc

Not all that long ago, the chief threat that many demonstrators faced in the United States and Europe was the blunt impact of police batons. In response, some demonstrators—notably the *Tute Bianche* in Italy—took to wearing helmets and padding and reinforcing massive inflatable inner tubes and other flotation devices to protect their bodies from the fists and clubs of the police. Some demonstrators in the United States embraced these tactics, which came to be known as “padded bloc.” A widely distributed zine, *Bodyhammer,* explored helmets, body armor, shields and shield walls, and an array of defensive tactics and formations in this vein.

Today’s demonstrators still stand to learn a lot from the tactics developed at that time, especially where they can be deployed in contexts where there is little threat of lethal violence or fascist attacks. Essentially, padded bloc tactics are most effective as a sort of militant civil disobedience aimed at slowing or inconveniencing an adversary who is not prepared to escalate to potentially lethal force. They are more useful for distracting and delaying than for winning offensive victories, but they can play a valuable part in a larger ecosystem of interlocking tactics and strategies.

In this guide, we will focus chiefly on forms of armor that can protect against knives and guns, in order to expand the range of options at the disposal of the modern protester.



Anti-capitalist demonstrators opposing the G8 summit in Genoa, Italy in 2001.

Pay Attention

First and foremost, pay attention to what is going on around you. Street demonstrations can be chaotic and loud. Police may employ tear gas, flash-bang grenades, LRADs, and other noisy weaponry, while protestors sometimes set off fireworks—which can sound an awful lot like gunfire. When you are surprised by loud bangs in the streets, try to identify the source and what kind of risk it represents.

Stay aware of the location of anyone who is openly carrying a firearm, as well as anyone you have reason to believe may be carrying a concealed weapon. People have been hit by friendly fire at demonstrations as well as hostile fire. If you are working with an affinity group, you could designate one person to keep an eye out for potential threats. Take turns occupying this role, so one person doesn’t become exhausted from being constantly vigilant. In any case, all parties should stay aware, as things can shift rapidly.

Communicate clearly and concisely, especially when you are describing individuals with firearms. This can help others to make wise decisions rapidly in an emergency, without contributing to undue panic. Here are two communication models you can employ to convey what you see.

Use the mnemonic device “S.A.L.U.T.E.” (Size, Activity, Location, Unit, Time, Equipment) to identify potential threats. For example, rather than shouting “They’ve got a gun!” you might report, “I saw three men (S) guarding the convenience store (A) at the intersection of Main Street and City Avenue (L). Possibly militia (U). This was at 11:15 pm (T). Two had long guns, I don’t know about the third (E).”

In emergencies, or when time is of the essence, you can use another tool called the “three Ds”: Direction, Distance, Disposition. For example, “Four unknown white men with rifles at my 1 o’clock, one block up, scanning the crowd with binoculars.”

Be Prepared

Much of what you can do to treat a gunshot wound takes place long before the shot is fired.

What Is a Gunshot Wound?

Gunshot wounds involve traumatic injuries and serious puncture wounds. Their impact on the body varies according to the type of weapon, the distance of the shooter, and the location of the entry wound. Depending on the size and speed of the bullet, gunshots can inflict different types of harm—including severe bleeding, muscle and bone damage, and destruction of organs. They can damage bodies in unpredictable ways.

While some calibers of ammunition may pass directly through a person leaving easily identifiable entry and exit wounds, other calibers are more prone to “tumbling,” or ricocheting, inside the body. This can cause more internal damage and less predictable exits. Worse still, some types of “self-defense” ammunition for handguns are designed to “mushroom” out on impact, causing severe harm.

Treat any gunshot wound as a potentially life-threatening injury, regardless of the details. If an artery is compromised, a person can bleed out in as few as three minutes. Once a person loses half their blood, their chances of survival decrease dramatically. It is up to you to act quickly.

Legality

We’re not lawyers. You should do your own research.

In the USA, it is federally prohibited for violent felons to own or wear armor designed to protect against bullets (referred to herein as “body armor”), except by special dispensation from an employer.

In addition to the federal law, each US state has its own laws regulating armor. In most states, it is illegal to wear body armor while committing a crime; being caught doing so could occasion additional charges. In Kansas, wearing body armor is prohibited at demonstrations, too. In Connecticut, you cannot have it shipped to your home. We have yet to obtain a solid answer regarding whether minors can own or wear body armor.

Motocross armor.

The legality of body armor varies widely from country to country. In some provinces in Canada and some territories in Australia, you need authorization or a license to wear it. The UK seems to have no laws restricting civilian use of body armor. The European Union bans body armor that is for “main military usage,” but this implies that certain forms of body armor are legal. It appears that body armor is legal in Japan and Hong Kong but prohibited in Argentina, Brazil, and Thailand. If you can share information about the laws in your country, please contact us.

Sourcing Body Armor

As of this writing, ballistic armor is hard to come by. The deepening political crisis has all sides scrambling to protect themselves; most retailers of both soft armor and hard armor are reporting delays on orders of at least two months. This makes it difficult to recommend specific products or retailers. We suggest learning about what you need and keeping an eye out for deals—or even just for notifications that a product is in stock.

At the same time, as the crisis appears to be deepening, it’s probably worth ordering now rather than waiting.

We know of one left-wing armorer, Red Star Defense. They manufacture their own ceramic III+ plates for a good price—currently $300 a pair—and retail IIIA soft vests for a very good price ($225), as well as selling plate carriers and tactical gloves cheaper than you can find elsewhere. They currently have a 4 to 8 week lag on armor orders. We recommend Red Star Defense because their goal is not profit but to protect the bodies of working-class revolutionaries.

Most body armor retailers aim at some combination of three markets: police and military personnel, right-wing paramilitaries, and private security (and, by extension, those involved in illegal capitalism). A few retailers also focus on protecting civilians and schoolchildren, promoting “bulletproof backpacks” and similar products that cash in on rampant gun violence in the United States.

The best market we’ve found so far for fast-turnaround body armor orders is eBay. New IIIA vests can be sourced from the UK and Canada ready to be shipped; surplus vests from the US should ship quickly as well, though the stock of those varies. Most surplus vests are surplus Kevlar inserts placed within new vests.

Opinions vary about surplus vests, but for the most part, they are considered acceptable. Because Kevlar degrades from UV exposure, it comes with an expiration date—usually five years from manufacture. Police departments replace their gear after five years. But the armor remains effective long after—in every test we’ve seen, expired Kevlar vests continue to defend against all the threats they were rated to protect against. It’s impossible to recommend using expired vests, because there’s no way to guarantee their safety—but used vests perform favorably and are substantially cheaper than new vests. In addition, ironically, retailers of police surplus vests tend to be the retailers who least aim their sales at right-wing and police markets.

You can purchase vests, especially surplus vests, in person at army surplus stores. We have heard from people who negotiated good deals for bulk vest orders by sending one person—whoever is likely to be most agreeable to the owners—into a store with cash in hand, ready to purchase.

There is also a market for body armor on Armslist, which is like Craigslist but for guns. It appears that some enterprising folks, anticipating the current crisis, have stockpiled a lot of gear and are selling it directly. There are reportedly a lot of

A Demonstrator’s Guide to Responding to Gunshot Wounds

What Everyone Should Know

Gunshot wounds are becoming more common at demonstrations. This is not to say you should panic—millions of people have participated in demonstrations over the past four months, while only dozens have been shot. Still, as political conflict escalates in the United States, it is important to think about how we can care for and protect each other. The good news is that even if you have no medical training, there are things you can do to maximize the likelihood that a person who is shot in your vicinity will survive—simple things like learning the location of the nearest trauma center. Though this subject can be stressful to contemplate, the following guide may equip you to help save lives.

While many demonstrators have learned how to prepare for tear gas, pepper spray, rubber bullets, LRADs, baton blows, and arrests, few are currently prepared to respond to gunshot wounds. This guide is drawn from the experiences of several people who have witnessed or treated gunshot wounds in the course of political and social conflict. In order to demystify the subject and help readers imagine how they might employ this information, we’ve included two personal narratives describing experiences with gunshot wounds at demonstrations.

Although this text draws on the practical knowledge of a number of people with both institutional training and street experience, it does not represent professional medical advice. It includes some information that will chiefly be useful to experienced street medics, but most of it is relevant to any reader. It is not intended to stand in for actual training in gunshot wound response or other medical interventions. We encourage readers to seek out additional training, skills, and life-saving critical response tools.

everyone with green paint, you can tell by the green paint"—they can claim "this is someone I shot with one of these 16 pellets, as registered on the timestamp of my rifle camera."

The synthetic strands of DNA are carried by a UV ink substrate. It can be detected on a suspect with a UV light or smelled by specially-trained dogs. Presumably, the dogs are smelling the UV ink, not the DNA itself.

SelectaDNA
SelectaDNA

SelectaDNA has already caused controversy in the UK.

scammers on the site; if you're purchasing anything online, it's best to pay with a service that offers buyer protection, like PayPal, rather than through Venmo, which does not. If the seller doesn't want to pay for buyer protection, that itself is a red flag.

There are rumors that people using ArmsList have been set up for robberies. Consider meeting in a well-lit, public place during the day and bringing someone with you, especially someone who can legally conceal a firearm. You may wish to make sure that your clothing and vehicle do not give away your politics or other details about you. If you are purchasing with cash, pay only after you have obtained the item. When possible, buy from verified commercial sellers vetted by ArmsList.

A level IIIa vest.

Sports armor remains readily available. You can often acquire it secondhand for very cheap, although COVID-19 has made it more difficult to obtain it cheaply at yard sales and secondhand stores. You may be able to find quality knee and elbow pads at gun shows, as decommissioned military gear from the wars in Iraq and Afghanistan is flooding the market and driving down prices.

Sports Armor

Sports armor offers a cheap and reasonably effective way to protect yourself from impact weapons, police batons, and, to some degree, knives. It offers no protection from gunfire. You can usually source it secondhand; much of it can be concealed under clothing. It will probably look better in court than ballistic armor. It's legal for more people to wear it—it is less likely to occasion additional charges if you are arrested the way ballistic armor can. In the few instances we're aware of in which people received "possession of criminal tools" charges for wearing padding, the charges were ultimately dropped.

The fundamental principle of sports armor is the “shell/soft” model of protection. A hard external shell (usually plastic) takes the impact of a weapon, preventing penetration and dispersing the force of that impact over a broad surface area. Beneath the shell, soft padding absorbs the impact. Effective armor requires both of these parts. Steel medieval armor, for example, relied on a thick layer of quilted cloth to reduce the impact of the blows. Some modern sports armor lacks a hard shell, including padded shirts and pants and boxing helmets; these are less appropriate for our purposes.

While ballistic armor is designed to protect your vital organs from gunfire, sports armor is designed to protect more of your body—for example, your shoulders, forearms, or joints, depending on the armor. Against police impact weapons, this can be crucial. Police are trained to aim most impact weapons at the navel or below; they often specifically target knees or limbs. Yet they also regularly shoot people directly in the chest, back, or head with impact weapons, and jab batons into the chest or abdomen or else swing at people’s backs or heads.

MASTERGUARD

Fending chest protection.

The top priority is to protect your head. After that, you can consider kneepads, as impacts to the knee are more disabling than strikes to much of the rest of your body. When impact munitions kill people, it is usually because they strike a person in the head or chest; chest injuries can break a rib, which can puncture a lung or heart. This is very rare, but protecting your chest isn’t a bad idea. Some people who anticipate close encounters with club-wielding attackers—such as far right demonstrators or police—also wear forearm guards, often repurposing youth shin guards. These can be used to block blows from a stick or a baton, although such guards hardly guarantee safety.

Removing DNA marking

Since all available evidence suggests that DNA marking is carried in a UV dye, it seems probable that it can be removed in a similar way as one goes about removing UV dye. Most manufacturers claim that the marking lasts for “days,” or “several washes,” although at least one claims it lasts for “weeks.”

One manufacturer, Security Devices International (SDI), claims that it lasts 3-5 days on a person but 2-5 years on clothing.

Rumors from Portland suggest that the synthetic DNA is degraded by UV light. Some people have suggested that any clothes that one might not want to destroy or throw away—for example, body armor—should be left in the sun for several hours, with someone turning them regularly to make sure all parts of the items are exposed. Sunlight is bad for the plastic polymers of armor, especially soft bulletproof vests, so this might not be recommended for some materials. People also suggest using alcohol or hydrogen peroxide to break the DNA tag down, but this might degrade the material as well, especially in the case of hydrogen peroxide.

It all depends on how important it is to destroy the evidence that you were in a particular crowd at a particular time. Depending on the severity of the risk, you might replace all of your affected clothes and spend considerable time washing and exfoliating—or you could simply wash everything a couple times, take a few showers, and check yourself with a UV light.

SelectaDNA

Perhaps the first company to develop synthetic DNA marking for police use was SelectaDNA in the UK. SelectaDNA sells DNA spray, gel, and other devices directly to consumers for the purpose of home security. They also sell less-lethal .68 caliber air-powered weapons, a rifle and a pistol, to shoot DNA marking rounds at rioters. Both of these guns have an effective range of 30-40 meters and use 8-round magazines and a 20-round disposable CO2 cartridge. They are semi-automatic and can fire six rounds in a second. Each comes equipped with a camera. It’s unclear if the SelectaDNA pellets can be fired by other .68 caliber air guns.

Each pack of 16 pellets is uniquely coded. In theory, this means that police can do more than argue “this person was at the demonstration where we shot

There are cheap, small flashlights available that come with both regular and UV LEDs. Usually, they are used by employees working door security to look for hand stamps—or by people who are checking their bedding for bedbugs.

DNA marking

There's paint, there's invisible ink, and then there's… DNA marking. Actually, there are two different things that are called DNA marking. The first is a chemical weapon, usually a spray, that contains a unique blend of different metals and other materials, acting as a sort of chemical fingerprint that can be identified later. This type of tagging uses the word DNA only as advertising jargon. Each can, or shipment of cans, might contain its own unique fingerprint, though we have not been able to confirm this.

The other style of DNA marking uses DNA, literally. This DNA marking is a system that marks a target with synthetic DNA that can live on clothes or skin for several weeks. Both systems of DNA tagging work the same way: if someone is identified later by way of these tags, this can provide concrete evidence in court connecting them to potential criminal behavior.

There is every reason to believe that police are using one or both of these methods, though it is hard to know which one and precisely when they are using it. The 40mm DNA Forensic Marking round, for example, made by Security Devices International, Inc, uses a "botanical encrypted taggant in water" which we believe refers to actual synthetic DNA.

All the DNA marking materials that we've been able to find seem to be suspended in UV ink for dispersal, although we know of no reason that they would have to be.

As of this writing, we have not heard of any arrests or court cases related to the 2020 uprising that involved DNA marking. Most after-the-fact felony arrests of protestors seem to hinge instead of livestream footage and social media posts. This does not mean that it is not in use or that it will not be used in the future.

On Twitter, Minneapolis police have openly discussed using DNA marking spray, although they have not specifically claimed to have used it on protestors. It's possible that they were conflating "UV marking" with "DNA tagging."

Do-It-Yourself Armor

It is possible to make your own effective armor, although secondhand sports equipment is often available so cheaply as to render this unnecessary. When making do-it-yourself gear, make sure it follows the shell/soft model. For the shell, plastic is the lightest and generally best, but sheet metal can also work—as can rubber, wood, or even thick magazines. We know one protestor who wears forearm guards made out of old license plates. While not particularly rigid, orange road cone material is better than nothing and often readily available. You can repurpose the plastic of barrels or buckets in a number of ways. We've come across one particularly promising method of creating simple breastplates from 5-gallon buckets that we're excited to try, though for our purposes it would require foam padding on the back.

Blue foam mat.

For the "soft" in your shell/soft armor, closed-cell foam is usually the best thing. Yoga mat material is often cheap and effective. The blue foam from the $5 camping mats from WalMart is considered cheap and good by people who make their own sports gear. Even packing foam can work. Try attaching it with spray adhesive or, better, contact cement.

DAP
Weldwood
THE ORIGINAL
Contact Cement
El Cemento de Contacto
Original
Uses: Decorative Laminates, Veneers, Foam, Cloth, Metal
Leather, Wood, Particle Board, Plywood
32 FL. OZ. (946 mL)

Contact cement.

Some people have used the following method to make custom armor for free. Recover mattresses and 5-gallon buckets from the trash; cut the buckets into strips roughly matching the part of the body to be covered (thighs, shins, arms, and so on) and put the strips into an oven at low temperature. Don't melt the plastic—just soften it a bit. Some people prefer to use scavenged ovens for this purpose rather than an oven they use to cook food. Meanwhile, rip foam out of the mattresses and tape that temporarily over the part of your body part to be covered. Take the plastic out of the oven and mold it over the foam; once it has cooled, use spray glue or contact cement to attach the foam to the inside of the plastic.

Knife Resistance

In our experiments with making DIY plastic knife-resistant armor, we discovered that any hard plastic plate will be substantially slash-resistant, but that armor requires fairly thick plastic to be stab-proof. One of our testers was not able to get a knife through most sheet plastic, but another tester was able to get a knife through almost every piece of plastic we put in front of them. Still, most stabs in a tumultuous brawl will not be full force and a hard plastic layer will provide substantial resistance even if it is not knife-proof. This degree of protection might still be the difference between a painful cut and a punctured organ. We have yet to test sports armor specifically against knives and impact weapons.

Cut-resistant sleeves.

Medieval Armor

Medieval armor was generally designed according to the same principle as modern sports armor: a hard shell backed by padding. Those who wear medieval armor for sport today have done a lot of work updating medieval armor for modern purposes. Most of this can be adapted to protest use.

Steel armor tends to weigh more than plastic armor; its primary advantage over plastic armor is cut and slash resistance. This is less important to demonstrators who are looking to protect themselves from blunt impact.

Two modern groups that wear and understand medieval armor are the Society for Creative Anachronism (SCA) and those who study Historical European Martial Arts (HEMA). Both tend to wear a combination of steel and plastic armor, but the SCA in particular has developed DIY plastic armor designed to protect all

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Removing Paint

The easiest way to deal with a mark on your clothes that identifies you as a suspect is to get rid of the clothes. You should make this decision according to how important they are to you and what you fear you might be arrested for. A court case is usually more expensive than a windbreaker. You may also be able to leave an item of clothing somewhere—for example, in a bush or trash can—and come back later to see if you can recover it.

Washable paint and chalk should be the easiest to remove. It should wash off of skin with water, or soap and water and scrubbing. One way to remove water-based paint from clothes is to let the paint dry, then scrape off as much as you can with a butter knife or the back of a spoon; then hand-wash the item, passing warm water through the fabric from behind the stain, blotting it with a rag or paper towel; then mix half-detergent and half-water and rub that into the stain. Then rinse, and repeat the last step until the stain is gone or you are no longer drawing paint out of the clothes. In a worst-case scenario, try using small amounts of acetone (nail polish remover) or rubbing alcohol—but be advised, this might damage the item.

Oil-based paint, which might be used in the “indelible” paint, can be removed from skin by mixing olive oil and dish soap, lathering up your skin, and rinsing it off, repeating as necessary. You can remove oil-based paint from clothes by putting your clothes inside out on a stack of rags or paper towels and then pouring turpentine or another paint thinner onto the fabric from behind the stain, blotting it with rags. Once no more paint comes out that way, rub dishwater detergent into the stain and then leave the clothing in hot, soapy water overnight. Rinse it thoroughly in the morning, then throw your clothes into a washing machine.

UV ink can also be removed from both skin and clothes. In some ways, it may be easier to clean than other inks because it doesn’t really dry except under UV light (we are unsure if the UV light in sunlight will cause it to dry). Most UV ink appears to be alcohol-soluble, so using rubbing alcohol or even hairspray should help remove it from skin. Other recommendations we have seen include washing with diluted bleach water or scrubbing your skin with an abrasive mixture of sugar and dishwashing liquid. Still other people maintain that hot soapy water and plenty of abrasion will do. You could try washing your clothes repeatedly in hot water, checking with a UV flashlight as you go.

There are reports of police using pepper-ball rounds for marking at least as far back as the 2003 protests in Miami against the Free Trade Area of the Americas ministerial and the Iraq War protests of the same era.

We’ve been able to identify at least seven means by which police mark people:

- Malodorants
- Temporary powder
- Washable paint
- Indelible paint
- UV dye
- DNA marking

It is probable that colored, visible dye is used as well. These are often paired with other effects, such as 12-gauge beanbag rounds loaded with florescent green powder or FN303 rounds that add paint or dye to impact weaponry. We have also received reports that police in Portland have shined green laser pointers from the rooftops to mark protestors as targets for impact weapons or arrest.

There appears to be only one malodorant round on the market, the 40mm BIP Malodorant from Security Devices International, Inc. It is intended to mark people by smell and also to serve as a crowd deterrent. The smell was described by Fox News as “egg salad meets trash” and is said to disperse fairly quickly. None of us have heard of it being used at demonstrations.

Marking powder, paint, or dye can be applied via any means that chemicals are administered. Paintball guns, shotguns, and multi-launchers all have marking rounds available, and we’ve heard reports of police adding paint or dye to their water cannons.

We have yet to find information on the exact makeup of the paint or dye commonly included in marking rounds. Some manufacturers divide their products into “washable,” “indelible,” and “UV” or into “powder” and “liquid.” Security Devices International, Inc., for example, claims that their liquid marking round leaves a “semi-permanent stain” that “remains on the target and clothing up to 24 hours.” The data sheet for that particular round refers to its contents as a proprietary blend of inert materials. Other companies are no more forthcoming.

parts of the human body. Their designs are likely to be effective for demonstrators.

We cannot recommend steel for helmets, as the impact munitions police use deliver far more force than hand weapons do and deformation (denting) of steel helmets could endanger the wearer. We have researched this hypothesis, but have yet to test it.

Medieval armor makes for interesting optics. If you wear it overtly, it is bound to attract attention. Of course, both historically and in the modern era, armor has often been designed to look like clothing or be worn beneath it. The idea that people used to run around in shiny tin cans is largely ahistorical.

Medieval armor is not bulletproof—nor even particularly bullet resistant. To withstand bullets effectively, steel must be at least 1/4” thick and composed of an almost unworkably hard alloy.

Soft Armor

Soft armor vests are lightweight, concealable, effective against handgun rounds, and variably effective against knives. Ideally, you want a vest rated IIIA, although level II vests are often more available in surplus and are better than nothing. Level II protects against the average 9mm round—the most common handgun round in the US—but not against the “self-defense” 9mm rounds that gun enthusiasts commonly use. Vests can easily be very expensive (some can be had new for $250 or so, but most are $400+). Used or surplus vests (which are still usually $200+) might offer less protection than new ones, although this is both debatable and difficult to test with any given vest. Soft armor probably offers the best balance of protection, weight, and concealability for most demonstrators who are concerned about handgun fire.

Soft armor employs many layers of strong plastic fabric. Each layer absorbs more and more of the ballistic energy of the bullet until eventually it becomes caught in the fabric itself.

Most soft vests use Kevlar (a brand name for aramid fibers, a type of plastic fiber), but Dyneema and Spectra (brand names for UHMWPE, another type of plastic fiber) are a newer and stronger material that is becoming more common in various types of armor.

This principle has been used in armor for millennia. The medieval gambeson was a quilted fabric made of many layers of linen; while those who could afford to do so wore it under other armor, some combatants—such as peasants in revolt—wore it alone. It was particularly effective against arrows, as layered fabric is specifically good at stopping penetration.

When you choose a soft vest, you must choose between a "wraparound" vest, which has large protective inserts that protect your sides as well as your front and back, and a vest that only protects you from the front or back—functioning almost identically to a plate carrier, except with soft fabric armor in place of the plates. Wraparound vests are preferable in almost every way except price—most of the cheapest IIIA armor only protects your front and back.

A IIIa wraparound vest liner.

Like plate carriers, soft vests often come in both "covert" and "overt" styles [see below]. But since one of the primary advantages soft vests have over plate carriers is that they can be concealed, there seems to be little reason to consider an overt soft vest.

Materials

Soft vests come in two different types of plastic fibers: aramid and UHMWPE. You can't go wrong with either one. Aramid fibers (like Kevlar) are a slightly older technology; they are heavier for the same level of protection. UHMWPE fibers (like Dyneema) are fancier, newer, lighter, more UV resistant, and less resistant to temperature changes—this means they are less capable of stopping a "contact" shot, when a gun is held directly against the vest, as the fibers can melt. There is some debate about whether this is a significant problem.

Aramid fibers are the most common type of plastic used in bulletproof vests. The most popular brand is Kevlar, made by Dupont. Aramid fibers were the first plastics strong enough to make into ballistic armor. One other brand of aramid fiber used in armor is Teijin Aramid (previously known as Twaron).

Collecting Spent Munitions

Since there is so little oversight and so little information available about the weapons that taxpayers pay for police to shoot us with, protestors have taken to documenting spent shell casings to see what is being fired at them. Collecting spent munitions can contribute to useful pattern analysis. Some cities have people who are willing to come pick up munitions for this purpose. If your city doesn't have anyone pursuing this, consider taking it on yourself.

The National Lawyers Guild is interested in knowing what people are being shot with; they are collecting information. So are we. Please contact us with photos and information.

Police in Portland seem to be convinced—or are trying to convince people—that picking up spent munitions is a crime and they have threatened to fire more munitions at anyone caught doing it. They have not managed to figure out exactly what crime it is, and we are not currently aware of anyone facing charges for doing so.

Police munitions are often found unexploded or unfired. It's unclear to us if this is because these cartridges are firing without deploying properly, if they're jamming the gun and being ejected unspent, or if police are simply dropping munitions on the ground by accident.

When opening a bag of spent munitions, it is possible to experience secondary effects from gas residue. Consider storing them double bagged in ziplock bags. Only handle them in open-air environments while wearing gloves and protective clothing.

Marking

The police sometimes attempt to mark those participating in demonstrations or suspected of crimes in hopes of arresting them later. In some cases, they may simply use marking to frighten us by making us believe that they will come looking for us, in hopes of limiting what we choose to do in the streets. We know of far more times that the police have used marking than times that this marking was later used to identify people for arrest or was presented as evidence in court. We would love to hear from anyone with more information about marking, whether through experience or research.

Flash-bangs

These devices, which manufacturers call “distraction devices” or “disorientation devices,” are more commonly known as flash-bangs or stun grenades. They produce an intense flash of light and a loud bang as well as some concussive force. The light (upwards of 8 million candelas—as bright as eight million candles) blinds viewers for approximately five seconds and causes severe afterimages. The volume is around 160-180 decibels, substantially louder than any gunshot you are likely to ever hear; this deafens those in the vicinity, disrupting the fluid in the inner ear and sometimes causing dizziness.

Police occasionally use these in conjunction with baton charges or other impact weapons when they wish to knock demonstrators off guard. But at the end of the day, like so many police tactics, these are methods to intimidate people into complying, not methods that directly force people to comply.

Flash-bang grenades are generally made of solid steel or aluminum, designed not to fragment as a result of their detonation. Many of them are reloadable or refillable.

Some flash-bang grenades are “aerial warning/signaling” munitions designed to be fired into the air to explode over a crowd. These can come with or without chemical payloads; each round has a different range, ranging from 50 to 300 meters. There are versions for 12-gauge shotguns as well.

At least one manufacturer says that there should be a clear area of 5-6 feet around the site where a flash-bang will detonate; still, police regularly throw, fire, and roll these into crowds. While some are packed with rubber ball munitions, most are designed not to cause harm via impact. Yet they can maim or kill people, usually through burning. They’ve also been known to start fires, particularly when deployed indoors.

CTS
COMBINED TACTICAL SYSTEMS
MODEL 7290
FLASH BANG
1.5 SECOND DELAY

Flash-bang grenades.

Aramid fibers break down from UV exposure. The outer shell of a bulletproof vest generally protects them from this.

Ultra-High-Molecular-Weight Polyethylene (UHMWPE, sometimes simply called PE) is a plastic fiber that is increasingly common for armor of all types. Soft vests are made of layered fabric; hard plates are often backed with it or made entirely from it; modern military helmets are made from it instead of aramid fibers. It is stronger by weight than aramid fibers, so that armor can be made slightly thinner and lighter.

The two most common brand names of UHMWPE fiber used in armor are Dyneema (made by DSM) and Spectra (made by Honeywell).

While UHMWPE is not inherently UV resistant, it can be made so reasonably easily and Dyneema is considered substantially more UV stable than Kevlar. We have not been able to find comparable information about Spectra besides the fact that it is advertised as more UV resistant than many other fibers, presumably including aramid).

UHMWPE has a much lower melting point than aramid; some speculate that it degrades from heat as a result. We found footage of one manufacturer lighting their vests on fire for a full minute, then testing them and finding that they continued to stop bullets. The same manufacturer also tests contact shots against their vests, although we don’t know whether all UHMWPE vests would produce the same results.

In any case, it is generally unadvised to leave any soft vest containing UHMWPE in any environment that might exceed 180 degrees Fahrenheit, and they are still considered more vulnerable to contact shots than aramid fiber vests.

Plate Carriers

Plate carriers are practically the only game in town if you are looking to protect yourself from rifles. For a plate carrier, you need two things: the carrier—a fabric vest with sleeves to hold hard plates—and the plates. Generally, you want plates rated III+, ideally ceramic or a combination of ceramic and PE (polyethylene, usually the UHMWPE mentioned above). Side plates are likely overkill and needless weight and expense, as are level IV plates, the most protective armor. Hard plates are ostensibly more knife-proof than other forms of armor, but an overt plate carrier is so obvious that a determined attacker would simply aim where you aren’t protected.

Plate carriers are only designed to protect the most vital areas of your chest, an area sometimes referred to as the “kill box.” Most shooters are trained to aim for “center body mass” because it presents the largest target and offers the most vulnerabilities. With the exception of head wounds, wounds elsewhere on the body are less likely to kill you, so most armor systems do not prioritize preventing them.

Plate carriers come in “covert” and “overt” models just as soft vests do, with covert ones designed to be worn beneath clothing and overt ones designed to be worn over it.

Plates

It’s considered good form to pick your plates first and then match your carrier to them, though you can do it in the opposite order as well.

There are several things to consider regarding plates, including composition, size, cut, and curves.

Composition

Plates comprise a range of things that stop bullets. We’ll cover soft plates, steel plates, ceramic plates, and PE plates.

Soft plates are made of layers of the ballistic fabric discussed above in the section on bulletproof vests. If you’re looking for modularity, you could keep a pair of soft plates that you can insert into your plate carrier instead of hard plates when you want a lighter armor. Advantages: light, flexible. Disadvantages: poor protection.

Steel plates are the most common, but are going out of style. Steel plates are slabs of steel, about .25” thick. The most common alloy of steel is AR500, a particularly hard steel. It’s used primarily for armor, plow blades, construction and mining gear, and the like. Steel plates are easily 8 or 9 pounds apiece. (There is also an armor manufacturer called AR500; they make armor of all types, confusing matters.)

MPK

Western readers are unlikely to ever be exposed to MPK (N-nonanoylmorpholine), a tear gas used in Russia that is reported to be effective against dogs and people who are too intoxicated to be easily incapacitated by other chemical weapons. It is not as strong as other chemicals, so it is generally mixed with CS or CN gas. It is presumably less toxic than the chemicals it is mixed with, as it is reportedly sometimes used as a food additive as well.

Smoke

Many canisters the police employ are just smoke grenades. Police use smoke grenades to mark areas with colored smoke, to hide their own positions and actions, to cause panic in the crowd, and, possibly, to refract lasers pointed their way (we are unsure of the efficacy of this, as there is a great deal of mixed information about lasers). Most chemical weapons manufacturers also offer smoke grenade versions of their various canisters and grenades.

TD
FLAMELESS
TRI-CHAMBER
SAF-SMOKE
DEFENSE TECHNOLOGY

A "Saf-smoke" grenade.

Many military-style smoke grenades, called HC or HCE grenades, contain Hexachloroethane. Hexachloroethane is toxic through skin absorption, depressing the central nervous system; it is presumed to be a carcinogen. In mid-2020, federal agents in Portland, Oregon used outdated grenades containing HC. According to one researcher, HC is no longer manufactured in the USA, but is harvested as a byproduct of other chemical processes. While it is toxic, it seems considerably safer than the other chemical weapons police employ.

“Saf-smoke” grenades, the style manufactured by Defense Technologies, are advertised as less dangerous. The actual contents of Saf-smoke and other competing brands of smoke grenade are proprietary and not immediately available for review.

Pepper Spray: OC

OC (oleoresin capsicum) is the only organically derived riot control agent we are aware of. It’s derived from capsaicin, the active component of chili peppers.

As far as the ostensible purpose of riot control agents go, OC seems to be the most effective: it is substantially more irritating and incapacitating than CS or CN gas, with a faster onset time than either, while apparently inflicting substantially fewer long-term adverse health effects on those exposed to it.

OC was first introduced as pepper spray, but has increasingly found its way into tear gas variants as well, appearing in tear gas grenades (both slow-burning and instant clouds of dust) and laced throughout impact weapons.

Lest we paint too rosy a picture of OC, it, too, can kill people—specifically, those who are exposed to a great deal of it, such as when police torture restrained arrestees with it, which is a common enough procedure. In particular, it can kill asthmatics by blocking off their lungs to air by “severe acute bronchospasm.”

OC in spray form is often suspended in propylene glycol, which is comparatively harmless by itself.

PAVA

PAVA (Nonivamide, pelargonic acid vanillylamide) is a (usually) synthetic form of OC that is more common in Britain, where it is the most common form of pepper spray, than in the United States. The only use of it we’ve identified in the US so far is in pepper-balls and FN303 rounds.

PAVA does appear naturally, but manufacturers generally synthesize it. It is more heat-stable than OC. It is edible in the same way that OC is. We have yet to find any particular differentiation between the toxicity of PAVA and OC.

Most PAVA spray is suspended in aqueous ethanol. This is sometimes called PAVA 1. In other cases, it is suspended in a mixture of mono propylene glycol, ethanol, and water referred to as PAVA 2. PAVA 1 is flammable, while PAVA 2 is not. Neither are made of chemicals we know to be particularly toxic.

Steel plates are less popular now that ceramic plates are becoming more affordable. Steel plates are substantially heavier. When struck at an angle, they can cause bullets to ricochet, and they’re capable of causing “spalling,” in which tiny shreds of steel go flying. Vertical spalling is the chief concern, as that can go up toward your face.

The only steel plates worth considering come with a buildup of “spall coating,” which is usually the same stuff that truck bed liners are made of (such as the spray-on Rhino Liner), though we believe that some manufacturers use fiberglass sleeves instead. Many manufacturers come with options regarding how thick you want your spall coating to be. A thick (“build up”) coating is more important for the front plate than the back plate. Spall coatings will usually protect the wearer from two or three hits before there is more vertical spalling.

Now that ceramic plates are affordable, the main advantage of steel plates is that they are thinner than ceramic ones and more capable of handling more rounds at the same point of impact.

Ceramic plates are sometimes called composite plates because they are not usually made entirely of ceramic. They work by breaking down upon impact, absorbing most of the force of the bullet, which is then stopped by a second layer. Once, this second layer was usually composed of steel, but nowadays polyethylene is most common. Ceramic plates are generally between five and six pounds and .75” to 1” thick; the cheaper plates tend to be thicker and heavier.

In order of increasing cost and efficacy, the three most common types of ceramic are Alumina, Silicon Carbide, and Boron Carbide. Alumina has to be thicker and heavier to offer the same amount of protection as Boron Carbide, but is substantially cheaper. It might be better to buy multiple sets of Alumina plates to distribute to friends than a single fancy lightweight set of plates that only you can wear, although thinner plates are more concealable.

There are fears that ceramic plates might degrade from rough handling, but current opinion is that this concern is overblown.

One danger with ceramic plates is that to save cost and weight, most manufacturers use foam rather than ceramic along the edge of the plate. This is usually mentioned in the item description. One plate we handled had a full inch of foam around the edge—reducing an ostensibly 10x12” plate to dimensions of 8x10” in full effectiveness—although the PE runs edge to edge beneath the ceramic and it’s generally considered to be IIIA rated (enough to stop handgun rounds) on its own. Red Star Defense advertises “edge to edge” ballistic ceramic.

We recommend ceramic plates because they are substantially lighter and don’t have issues with spalling. However, they will not survive as many shots as steel armor, and because they are less rigid, they are more prone to backface deformation (denting), which transfers more of the force of impact to the wearer. You can mitigate this danger by using trauma pads, which are essentially just extra padding.

HANDLE WITH CARE
A ceramic plate after multiple impacts.

PE (polyethylene) plates are plates made entirely of UHMWPE. As with soft armor, it relies on multiple thin layers. Unlike soft armor, the layers are heat-laminated together. When a bullet strikes the plate, it breaks apart each layer one at a time, and this delamination absorbs force each time. Because this process can cause a fair amount of back deformation, most PE plates are backed by a layer of foam.

PE plates are substantially lighter than other hard plates—often less than three pounds. They’re also buoyant in water. But they are much thicker (1-1.25”) and therefore less concealable. Most importantly, we have not been able to source any plate rated higher than level III—it seems that armor-penetrating rounds cut right through the plastic layers. Because the AR-15 is the most common rifle threat in the United States and some available AR-15 ammunition options can penetrate level III plates, we cannot recommend them for safety.

UHMWPE plates.

DM Gas

DM gas (Adamsite, Diphenylaminechlorarsine) is another largely outdated and particularly vicious tear gas agent. Chemists in both Germany and the US developed it independently in the 1910s. It was originally burned in “candles” to disperse the gas.

DM gas is particularly ineffective as a riot control agent, as its effects take 5-10 minutes to set in. It would only be useful for inflicting punishment—for which purpose it would likely be effective, as its effects can easily last 12 hours. It starts like other tear gasses, with irritation to the eyes and lungs, but this develops into nausea, headache, and persistent vomiting.

DM gas was most notoriously used in the United States against the “Bonus Army,” a demonstration of 45,000 veterans of the First World War and their allies in DC in 1932. Eyewitnesses say that the gas suffocated two young children, though historians have been unable to confirm this.

Some people conjecture that DM gas was in use by federal agents in Portland in the summer of 2020, but it remains unproven. There were rumors describing green smoke that might have been DM gas, and reports that some tear gas had made people vomit. So far, no one has been able to prove or disprove this, though some green gas utilized in Portland has been identified as HC gas.

VETERANS
BONUS MARCH
ON TO WASHINGTON
Toxic DM gas was used to target World War I veterans who participated in the “bonus march.”

CR Gas

CR gas (dibenzoxazepine) is a tear gas agent that is suspected but not confirmed to be in use in the United States. It was developed in the UK in the 1960s and earns its nickname “fire gas” for its capacity to not just hurt your lungs and eyes, but to make your whole body feel like you’ve been thrown into a patch of nettles. It is said to smell sweet.

CR gas is allegedly 6-10 times more potent than CS gas, and while all the documentation we’ve found says that it is “less toxic” than CS, it is known to be capable of killing people by asphyxiation or pulmonary edema (liquid filling the lungs).

One of the worst things about CR gas is that it is substantially harder to decontaminate than other riot control agents. It can persist on surfaces for up to 60 days.

We have not found any manufacturers who advertise any products that contain CR gas.

Some protestors in Portland conjecture they might have been exposed to CR gas because some gas they were exposed to reacted particularly strongly to their sweat. The theory is that federal agents, tired of gas-masked protestors, utilized a weapon that causes suffering even to those who are masked. These federal agents might have access to old stores of CR gas, or perhaps do not need to go through public-facing commercial channels the way local police generally do.

However, CS gas (and perhaps especially expired CS gas, which might cause larger flakes that persist longer on the skin) also reacts to sweat to cause burning, and can be dispersed through sweet-smelling solvents. Chemists and others are currently trying to work out whether CR or DM have been in use in Portland.

One mysterious green gas officers utilized to assault protesters in Portland has been identified as HC gas.

Any hard armor containing PE, such as ceramic or standalone PE, should not be exposed to temperatures above 180 degrees Fahrenheit.

Size

Roughly speaking, a plate should protect you from your collarbone down to a few inches above your navel and from nipple to nipple.

To make everything as confusing as possible, there are two different sizing standards in use in the USA. We’ll call them civilian and SAPI.

Civilian plates, which are what we are most likely to encounter, are available in 8x10”, 10x12”, and 11x14” dimensions. The 10x12” size is the most common.

A full cut plate.

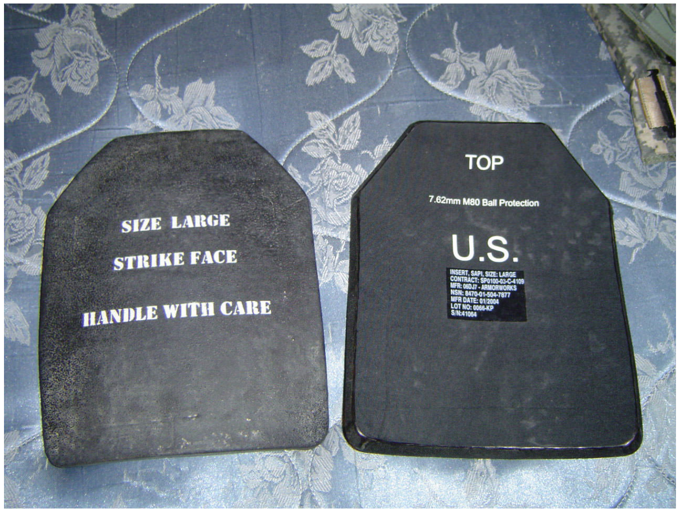
SAPI (Small Arms Protective Insert) is the military acronym for protective plates. SAPI plates come in a very specific cut (the SAPI cut), but in five different sizes: extra-small (7.25x11.5”), small (8.75x11.75”), medium (9.5x12”), large (10.25x13.25”), and extra-large (11x14”).

The best way to size a plate is to measure your body, then choose the plate size that closest fits you. Of course, you may not have access to all the possible sizes.

Cut

Plates come in a number of different shapes: **full cut, SAPI, shooter’s,** and **swimmer’s.** The differences between these are minor, and each cut (besides SAPI, a military standard) differs from manufacturer to manufacturer. While most plates are sold in pairs, many people mix and match, with a regular SAPI cut back plate and a deeper shooter’s or swimmer’s cut front plate.

Full cut plates are essentially rectangles with the corners rounded off. They are not common but can be used for side plates or back plates. They may not fit in many carriers.



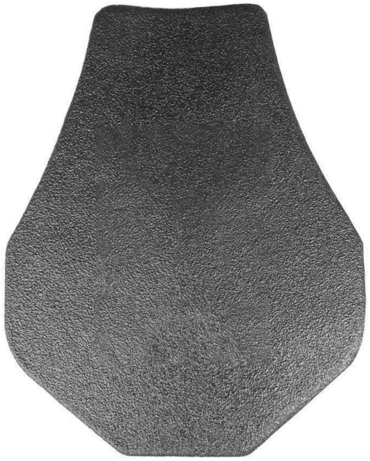
SAPI plates, shooter's cut.

SAPI plates are the standard military hard plates. They have a nearly-45 degree angle cut from each part of the top. SAPI plates work well and offer a good deal of coverage. Actual military SAPI plates are not sold directly to the public, but manufacturers sell plates in “SAPI cut.”

Shooter’s cut plates are similar to SAPI plates but have slightly more of a cut away at the corners. Some manufacturers sell right-handed or left-handed plates and further accentuate the cut on the dominant arm for better mobility.

Shooter's cut steel plate.

Swimmer’s cut plates have substantially deeper cuts away from the top corners, forming a vaguely teardrop shape. This sacrifices protection for mobility. Some people with breasts or other curves find a swimmer’s cut most comfortable.



Swimmer's cut steel plate.

CS gas (unlike OC and the Russian tear gas MPK) is not generally considered as effective against dogs, bears, and some other mammals owing to different tear duct structure and some resistance from fur. It certainly causes discomfort, and studies have shown it is capable of killing dogs. Anecdotal reports from Turkey describe it killing birds by the thousands and blinding street cats.

As with all chemical weapons, the police do not use CS in a “pure” form—and the other chemicals it is adulterated with can also be toxic. We believe that the liquid/spray version, at least the one that the UK police use, employs methyl isobutyl ketone (MIBK) as a solvent. MIBK is itself toxic and can cause liver and kidney problems.

At least at the siege in Waco, the US government used CS aerosolized along with the solvent Dichloromethane, which has a sweet odor. It is carcinogenic.

Some comrades reported that at least some of the gas used during the G20 protests in Pittsburgh in 2009 smelled vaguely like banana candy.

CN Gas

Phenacyl chloride is a common chemical used in organic chemistry. When it is weaponized as a tear gas, it is called CN gas (2-Chloroacetophenone). It was first developed as a tear gas during the First and Second World Wars, though it is not known to have been used during them.

CN gas is commercially available through any number of police weapon manufacturers, although there is no reason why it should be, considering that it is substantially more toxic and substantially less effective than CS gas. It is less common than CS or OC, but can be found in tear gas canisters, sprays, and laced throughout impact weapons.

CN gas was the active ingredient of “Mace,” the first brand of self-defense spray, before OC was developed.

CN gas has killed at least five people via heart damage or asphyxia. It has also caused contact dermatitis—sometimes permanently—in an unknowable number of police officers whose chemical weapons have accidentally leaked onto them. If it can injure police in that manner, it can injure us as well.

Types of Chemical Agent

We'll review the properties and effects of the more common chemical agents here.

CS Gas

CS gas (2-chlorobenzalmalononitrile, C10H5ClN2) is the most common tear gas agent. Two US scientists, Corson and Stoughton, were the first to synthesize it; they named it after themselves. It was not weaponized into tear gas until the 1950s.

CS gas is found primarily in tear gas canisters, but it also appears in sprays, or laced throughout impact weapons.

CS gas is perceived to be substantially less toxic than CN gas, while being more effective at disabling people. It's probably more toxic, and less disabling, than OC.

We know that CS can cause heart and liver issues. We know that intense exposure can cause chemical burns and scarring. But there is more.

In terms of immediate lethality, it is speculated that CS could kill in an enclosed space; protesters blamed several deaths in Tahrir Square during the uprising on CS. But this has not been confirmed. CS gas does seem to be less immediately capable of killing than other chemical agents. Its long-term effects, however, are troubling.

CM
RIOT
CONTROL
CS
DEFENSE TECHNOLOGY
2CS

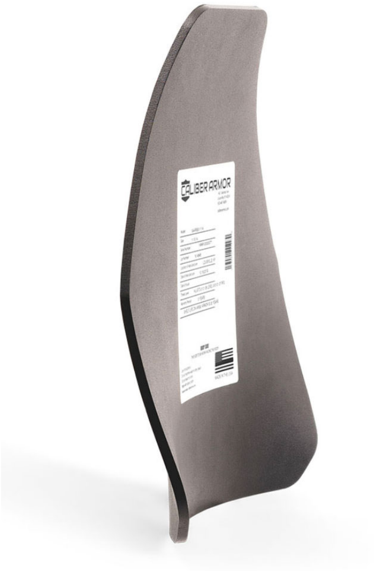
A CS gas canister.

Most toxicity reports on CS are over fifty years old; new studies are somewhat rare. The US military is increasingly finding links between CS gas and persistent lung problems by studying the incidence of lung problems before and after soldiers are exposed to the CS gas chamber.

CS gas is clastogenic—that is, it can change your chromosomes. This primarily affects people who are capable of menstruation. Science has been slow to study these effects, but a large number of stories describe miscarriages, excessive bleeding, cramps, blood clots, and seizures after exposure to CS gas.

Curves

Plates can come in three different curve styles: **flat, single curve,** and **multi-curve.** Once again, each brand has its own interpretation of each of these.



A multi-curve plate.

Flat plates are just that—flat. Most people don't like flat plates, though some people wear them, especially on the back. Sometimes flat plates are cheaper.

Single curve plates are the most common. These are curved on the vertical axis to better wrap around your torso.

Multi-curve plates curve in multiple ways to better fit what the manufacturer believes to be their average customer's body. These are generally preferable, especially for people with breasts or other curves. They're often more expensive. Not all manufacturers offer this option.

Stand Alone versus In Conjunction With

Most plates we've discussed are **Stand Alone** (SA or STA) plates. These plates are designed to perform at their rated level by themselves.

It's also possible to get **In Conjunction With** (ICW) plates. These are generally thinner and lighter but only perform at their rated level when worn in conjunction with a IIIA soft vest.

The modularity of the latter system has a lot to recommend it, but you will have to source a bulletproof soft vest with plate inserts (which are often more expensive) or else wear a plate carrier over your vest. ICW plates are harder to come across. The whole system is likely to be more expensive.

This style used to be the more popular military style, as it offers more protection, but current trends favor mobility over protection, and military forces seem to be shifting towards standalone plates.

Trauma Pads

When you buy armor, you might encounter “trauma pads.” This phrase actually has two different meanings. Before standalone plate carriers, **In Conjunction With** plates were called “trauma plates” and were inserted into sleeves on bulletproof vests to increase their ballistic rating. Now, however, “trauma pads” are usually non-ballistic foam inserts you put behind your hard plates in order to soften the blunt force trauma of an impact.

The value of trauma pads is hotly debated. They seem to be more important for ceramic plates than steel plates. It’s also increasingly popular for people to make do-it-yourself trauma pads out of yoga mat foam.

We don’t have enough information to come down hard on either side of this debate, but it might be worth getting or making trauma pads, especially if you have ceramic plates. It can’t hurt, and some people wear them just because they make the armor more comfortable, although they do add expense and thickness.

Do-It-Yourself Ballistic Plates

It is possible to make DIY armor plates. It’s probably only worth doing as a last resort. YouTube is a magical wonderland full of people testing various DIY forms of body armor. Some are easy to make; others are labor intensive. Some are affordable; others are expensive. We have not personally tested DIY ballistic armor and cannot recommend it, but there are situations in which armor is needed and not commercially available.

We’ve seen two common methods. The first involves laminating lots and lots of layers of Kevlar (better) or fiberglass (cheaper) with resin. This is labor intensive and not necessarily cheap, but it makes it possible to form the plates into various shapes. There are arguments about what kinds of resin work best; some people argue convincingly that using less resin enables the layers to delaminate upon impact and absorb more force.

The second method, which is substantially simpler and often cheaper, involves layering ceramic floor tiles—using the hardest ones available—with various thicknesses of steel and rubber. This method seems to make stronger armor that is less subject to back deformation. Some people argue that ceramic mosaic tiles offer better multi-hit capability, while others say that single larger tiles absorb

examine those bruises and apply a lotion, you’re showing that what happened to them matters and that the consequences are worth treating with care. The arnica lotion likely helps with the bruising, but the act of showing care matters too.

Some protestors in Chile have taken to spraying a room-temperature tea (made by boiling laurel leaves) into the eyes of those who are suffering from pepper-spray, and it seems to be effective. This is not a mechanical flushing of the eyes, but rather applied with a squirt bottle as an aftercare treatment to alleviate burning and to calm the person.

Some protestors in Hong Kong have carried spray bottles containing three teaspoons of baking soda for every 8.5 ounces of water. While the efficacy of this has not been directly studied, it lines up with the findings of a 2003 study to the effect that CS molecules are unstable and basic fluids like baking soda might accelerate that process of molecular breakdown.

The Geneva Protocol

Perhaps you’ve heard that the use of tear gas in war is a war crime, banned by the Geneva Protocol (which is distinct from and predates the Geneva Conventions). This is true. It’s not just that tear gas was accidentally swept up in a broad agreement not to employ chemical weapons, either. It’s in there explicitly by name.

In 1925, after the chemical horrors of the First World War, 38 countries signed the Geneva Protocol banning the use of chemical weapons. Most of the signatory countries assumed that this included tear gas and chemical herbicides dropped indiscriminately in remarkable quantities. The United States government decided not to share this interpretation. Throughout the 1960s, the US made extensive use of tear gas and herbicide (Agent Orange) in Vietnam.

Today, the Geneva Protocol makes it clear that tear gas is specifically prohibited.

Heads of state don’t want anyone else dropping chemicals on their civilians—but if that’s what it takes to maintain order internally, they’re all for it. So yes, international law explicitly forbids the use of tear gas in war, describing it as a war crime. But governments agree that it is fine to use it on us.

Medics in Portland have been manufacturing these with the help of a small rolling machine to distribute the moisture more evenly; they hope it will enable the wipes to keep longer. It also helps the medics to manufacture them more quickly.

Other Remedies

People use many different remedies and treatments for chemical weapons—everything from milk to antacids and herbal concoctions. Based on our conversations with street medics and doctors, we recommend just using water for flushing out eyes and soap and water for washing skin. Why? After all, the doctor we spoke to pointed out that it doesn't usually hurt, medically speaking, to use milk to flush out someone's eyes.

We advocate for water because it's readily available and it's less likely to cause allergic reactions. We recommend it because it isn't gross—getting arrested soaked in milk isn't a pleasant experience—and because it doesn't leave telltale white residue like antacid does, which appears more visibly on darker skin and has been used (for example, by police in the Ferguson uprising) to mark suspects for arrest. Perhaps most importantly, we recommend it because it demystifies chemical weapons.

The idea that we need some sort of special remedy to treat exposure to chemical weapons adds to their mystique and the fear they can inspire. But there's nothing arcane about these irritants. Wash them off and get to fresh air. Even if you disagree with us that water is best, please do not interrupt experienced street medics who are applying water eye flushes. That is not helpful behavior.

There is an outdated protest technique (referred to as MOFIBA) that uses mineral oil to cleanse the skin of contaminants, but it has largely gone out of use because, if administered wrong (whether as a consequence of inexperience or of being applied in a tumultuous situation), it can do more harm than good. We won't detail it here. Soap and water are effective for cleaning the skin. Decontamination wipes are good—possibly better—if you have them available, but they are not necessary.

Additional care can sometimes be useful, both medically and emotionally. As one street medic put it, they rub arnica lotion onto handcuff bruises because when someone shows you the bruising caused by police handcuffs, they're showing you the physical evidence that they were assaulted and kidnapped. When you

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impact better. It's possible that aluminum oxide ceramic panels can be sourced from commercial manufacturers, possibly from China.

Some people combine these various methods in various ways.

One person made a thick, light plate out of DIY recycled HDPE from milk jugs that seemed to be roughly level 2 or 3A.

Another person proved that thick slabs of non-laminated UHMWPE don't do any good as armor.

The cheapest and strangest DIY plate we've seen is a $12 plate made from items from the dollar store: baking pans full of rocks and glue with a hardcover book as spall protection. This stopped some rifle rounds but not many.

One person we spoke to has had some success cutting steel plates from suitably strong and thick steel found in scrapyards. Steel that is too hard will shatter upon impact; steel that is too soft will allow penetration—and if bullets do pass through, they might leave additional jagged bits of metal. If you're going to take this approach, it is absolutely crucial to get enough extra material to test these plates. You can cut the plates to the desired shape with an angle grinder. DIY steel plates should absolutely be backed with trauma pads.

If you possibly can, you should get well-engineered, properly tested gear. Failing that, you had better carry out your own thorough tests on the gear you make yourself. One person who does so described the process thus:

1) Extensively research core concepts involved in the project, to understand considerations, potential points of failure, and potential reasons for failure. 2) Develop a minimal viable product standard that you hope to accomplish. 3) Determine the most basic test conditions possible, with as many variables eliminated as possible. 4) Develop initial prototype. 5) Test initial prototype. 6) Disassemble prototype to determine what worked and what failed, and to determine cause of failure. 7) Build next prototype with knowledge gained from testing. 8) Repeat. 9) Once you achieve a minimal viable product standard, start testing under increasingly harsh conditions—different temperatures, using different rounds, and so on—to determine resiliency and point of failure.

For a project like this, make sure you have access to a workshop and someone who knows how to use the necessary tools safely and effectively. The proper tools will make production and testing faster; they can also help ensure standardized outcomes.

Carriers

Many vendors will sell you the carrier and plates as a set, in which case you’re ready to go. Otherwise, you’ll have to pick a carrier for your plates. Be careful to pick a plate carrier that accepts the specific size and cut of the plates you plan to wear.

The Slickster, a popular plate carrier.

Plate carriers generally consist of two parts: the vest itself, which goes on over your head, and a cummerbund—a velcro belt that connects the front and back panels at your side.

Plate carriers come in two primary styles, **covert** and **overt.**

Covert Carriers

Covert carriers are designed to offer the option of wearing them under other clothing. They don’t tend to come with as many pouches and loops and other tactical loadout options. For protestors, covert carriers are likely the best option. A black covert carrier under loose-fitting black clothing is unlikely to be noticed as body armor, especially in the dark or in a crowd.

This has several advantages. First and perhaps foremost, police are less likely to tag you as a troublemaker and target you for arrest or other violence. Just as importantly, armed attackers may be less likely to target you. With firearms, one of the primary arguments for concealed carry is that a trained attacker will target known threats first. Basically, if someone walks into a store and starts shooting, they are likely to target anyone they see carrying a gun first. The same principle applies to armor: a shooter is substantially more likely to consider someone wearing armor to be a threat, and therefore to aim at them first. Furthermore, if a shooter knows you are wearing armor, they might intentionally shoot you somewhere other than where you are protected. Overt plate carriers are designed with soldiers in mind, whereas “operators” (spec-ops) are more likely to wear covert vests for the aforementioned reasons.

To deal with your clothes, wash them thoroughly, possibly through multiple cycles. Run the washing machine without anything in it afterwards to wash the inside of the washing machine itself. Drying your clothes outside on a line is preferable, so that any lingering effects can dissipate.

Tear Gas and COVID-19

Tear gas makes your nose run, and bodily fluids are effective vectors for COVID-19 infection. Concerned with minimizing the spread of a deadly disease, some medics who would otherwise be administering assistance to those exposed to chemical weapons have begun advocating that people treat themselves for chemical weapons exposure if they are able to. Failing this, you should wear gloves, eye protection, and a mask of your own when you are treating a person for chemical weapons exposure. Take care to clean and decontaminate as soon as you can.

Decontamination Wipes

Law enforcement use Sudecon wipes for decontaminating people from pepper spray and tear gas. Medics we’ve spoken to report that they haven’t seen a side-by-side comparison, but believe that Sudecon wipes might work at least as well as soap and water on skin.

Rosehip Medic Collective in Portland, Oregon has published a recipe for DIY decontamination wipes that were in wide use in the chemical-soaked streets there during summer 2020.

Begin with:

- 1 gallon warm water
- 9 cups white sugar
- 2 tablespoons citric acid

Mix this well, then combine it with 21 fluid ounces of baby shampoo and mix it gently. Soak high quality paper towels in the mixture, and pack them into ziplock bags a few of them at a time. These should keep for a few days, or a few months in a refrigerator.

How to Treat the Effects of Chemical Agents

Depending on the agent, most of the effects of chemical agents will clear up after about 30 minutes of fresh air. Avoid rubbing your eyes. If you have contacts in, remove them as soon as possible.

Rinse your eyes with water—or, ideally, have someone else rinse your eyes. The best way to rinse someone’s eyes is to take a sports-style squirt water bottle and spray water into their open eyes. Bring a bottle for this purpose and use it only for flushes; do not drink from it, lest you contaminate it with saliva. You can open someone’s eyes with your thumb and forefinger; wear clean gloves, if you have them. It is enough to open their eyes just a little bit. Start rinsing from the inside of the eye, near the nose, and work your way to the outside. Do one eye at a time. Ask them to blink; remind them to not touch their face. Repeat as many times as necessary.

Spray the water from the sports bottle with some force: the goal is to flush the chemicals off the eye. Rinsing your eyes will not immediately alleviate the burning, but it will enable you to begin to recover.

To get tear gas and other contaminates off your skin, wash with soap and water. If the gas has dried as a powder on you (which is especially possible with expired tear gas), brush the powder off your skin and clothes before rinsing. While it’s been suggested that water “activates” the powder form of chemical irritants, experience has shown that removing it with water, or soap and water, is effective.

When you meet people after being gassed, if you are still wearing the same clothes or have remnants of the gas in your hair, warn them. You may not be affected by traces of gas that could still provoke a significant reaction in them, especially if they have asthma or similar conditions. This can also be a concern if you are entering enclosed spaces with others. Treat the risk of exposing others to tear gas secondhand as a consent issue.

When you have exited the conflict area after exposure, take off your outer clothes and double bag them until you have a chance to wash them. Shower, scrubbing your skin vigorously with soap. Be careful when you wash the chemicals out of your hair: if any get into your eyes, your genitals, or open wounds, it will hurt.

You can wear covert vests modularly, with the option to swap in additional pouches and cummerbunds to switch the carrier to overt.

Unfortunately, the cheaper ceramic plates tend to be so thick that it is substantially harder to wear them covertly. If covertness is your top priority, consider saving up for more expensive, thinner ceramic plates. Although we cannot currently recommend steel plates, those are thinner as well.

Overt Carriers

By comparison, overt carriers are designed to be worn as the outermost layer and to function as a platform from which to hang gear. Traditionally, this means guns, magazines, communications equipment, first aid supplies, and whatever else a soldier needs for their purposes. We’re not soldiers, we’re protestors.

An overt plate carrier.

Overt vests still have a place, of course, for some people and some purposes. They convey militancy and preparedness and they normalize the use of armor. Overt vests in bright colors are often worn by first responders and others who need to protect themselves but are trying to identify themselves as noncombatants.

Plus, the ability to hang gear off a carrier is convenient for many purposes, such as radio communications and serving as a street medic.

MOLLE and Other Attachment Points

Military and tactical gear is often easily identified by the loops of webbing sewn all over it. This is called MOLLE (Modular Lightweight Load-carrying Equipment): a military system designed to allow the attachment of additional pouches, packs, sheathes, and the like.

Some MOLLE is laser cut, particularly on covert carriers: instead of webbing loops, slots are cut into the outermost layer of fabric.

Hook-and-loop (i.e., velcro) attachment points are also common on tactical gear, which are used to attach morale patches or even small pouches. Morale patches include the various emblems and signs that the military use to designate units and that tactically-minded civilians use to express political and subcultural affiliation. What 1” buttons are for punks, morale patches are for tactical gearheads.

Some specific manufacturers use other styles of attachment points as well.

For most covert plate carrier purposes, attachment points are not necessary.

DIY Plate Carriers

For anyone experienced in sewing, making a plate carrier is a reasonably simple affair, as it is not itself a ballistic product. We would recommend that any aspiring plate carrier maker get a simple plate carrier to copy.

You can make straps from webbing; 500D Cordura seems to be the most commonly used fabric for the vest itself. Most guides suggest double or triple stitching every seam.

Plates load into the bottom of the front and back sleeves and are generally secured by a generous flap of hook-and-loop.

Fitting Armor

If your plate carrier is well-fitted, the armor should sit at your clavicle. With your armor on, lift your arms and twist around to make sure the carrier moves with your body. Breathe in deep to make sure it’s not too tight; at the most, it should feel snug when your lungs are fully expanded. Then test the fit by doing a Burpee or some other athletic activity to make sure that it nothing on the carrier moves around or falls out. ### Fitting Armor to Different Body Types

Most armor is designed to fit able-bodied, athletic cis men. The further from that category you are, the more trouble you may have fitting body armor. It can be particularly challenging to obtain armor in smaller sizes and armor for people with breasts.

Soft body armor vests are substantially more forgiving than plate carriers, but can still be less comfortable for those with more curves. Some armor manufacturers design soft armor vests specifically to fit curvier bodies. These are less likely to be found at lower price points, although we’ve seen some surplus “female” vests on eBay.

Immunity

Rumors abound about immunity to CS or OC, particularly in military circles.

Some people do appear to be naturally immune to CS gas, or at least more tolerant of it. It is indeed possible to build up the mental capacity to continue to function despite the pain and other effects. But there is no evidence that it is possible to develop a physiological immunity to CS or OC. In fact, on the contrary, repeat exposure to CS gas is known to cause sensitization—the opposite of tolerance.

US soldiers are exposed to CS gas during basic training as part of “mask confidence training,” aimed at demonstrating the effectiveness of their gas masks. During these trainings, it appears that some small portion of the population (perhaps 2-5%, according to speculation we’ve seen) is naturally resistant to the effects of CS. On one forum, we read that a soldier who was highly tolerant of CS gas let someone pepper spray him, erroneously believing that pepper spray (OC) is the same thing. It turned out that he was not immune to pepper spray.

The other common rumor within the ranks is that drill sergeants develop immunity to the gas as a consequence of repeated exposure. What is likely happening, instead, is either that the officers who display some naturally occurring tolerance of CS are put in charge of the CS exposure chamber, or that these instructors have developed a mental, rather than physiological, tolerance for the pain and discomfort that the gas causes.

In any case, it is ill-advised to routinely expose yourself to CS gas in hopes of building up a mental tolerance to it. Exposure to CS gas can cause a number of long-term health problems. Nor is there any evidence that eating hot peppers or the like can increase your tolerance of it.

Some police academies apparently teach racist myths about pepper spray, suggesting without evidence that Latin American and East Asian people are more tolerant of pepper spray—and therefore, it is implied, need to be sprayed longer—because of exposure to spicy food. This is just the latest in centuries of white supremacist pseudoscience justifying cruelty.

If you are experiencing this, try to get out of the area where the gas is deployed, sit up or stand with good posture to open your lungs, and try to breathe deeply. Even if your breathing is still restricted, the additional oxygen will lower your ambient stress level, enabling you to address some of the effects of anxiety and decreasing your heart rate. If you see other people who appear to be on the verge of passing out, try to get them to somewhere safe outside of the area of deployment and encourage them to breathe as deeply as possible.

The other thing that chemical weapons are intended to do is intimidate us. They are used to keep us out of the streets, to keep us from accomplishing our goals. If you are still building your experience in the streets, we recommend that you speak with coolheaded people who have considerable experience in public order situations about what to expect and how to handle the stress of chemical weapons attacks. If you are experiencing large-scale police violence for the first time, and you have the option, it can be a good idea to pace yourself, leaving a stressful situation when it becomes overwhelming, in order to slowly, steadily build a skillset for dealing with it levelheadedly. If you are aiming for longevity as a participant in social movements, it's better to err on the side of caution at first than to ask too much of yourself, have a bad experience, and withdraw from the struggle.

Some of us have been hit by everything under the sun over the years and survived. The fact that we have and the experience of being among comrades who have persisted in spite of intense police violence have both done a lot to demystify the weaponry of the police.

For Those Who Are Particularly Vulnerable

Asthmatics and others with breathing difficulties should be particularly careful about exposure to chemical weapons. This could mean bringing a gas mask or being prepared to leave the area as soon as you see police preparing to deploy gas. It appears that asthmatics account for most of the deaths caused by these chemical agents. To be clear, while these agents do occasionally kill people, being gassed as an asthmatic is rarely fatal.

According to Sven-Eric Jordt, Ph.D., a tear gas researcher, children are particularly vulnerable to tear gas because of their smaller lungs, which have a very different surface-to-volume ratio than adults. This has not stopped federal officers from employing tear gas against migrant children at the US border.

Small vests in general seem to be hard to find on the surplus market, as surplus vests tend to come from police departments.

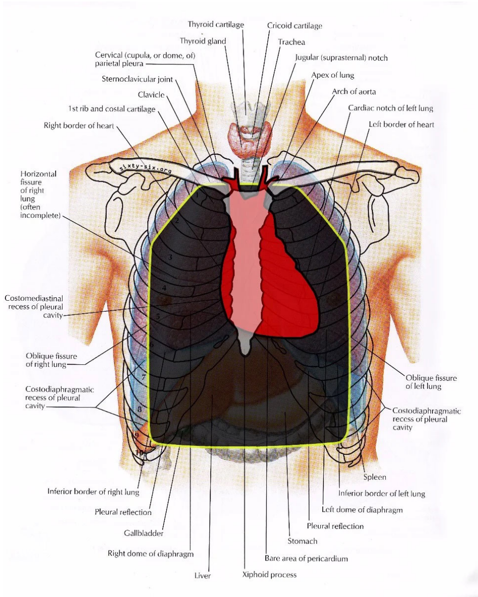
Plate carriers offer even fewer options for people with breasts. The best option we've been able to find is to get a multi-curve swimmer's cut front plate and wear either a tight-fitting sports bra or a chest binder.

Likewise, plates simply aren't made in sizes large enough for all people. It seems that most larger people wear the largest plate they can (usually 11x14"), even if it covers less of their torso.

Being Hit While Wearing Armor

There is a lot of contradictory information available about what happens to the human body when you're shot while wearing body armor.

When you're shot while wearing soft armor, the impact of the blow still hits you and can damage you, although the injuries are generally minor as the impact is spread out over a somewhat larger area. According to one study, 85% of those who are shot while wearing a vest rated for the right kind of impact suffer no injuries or minor injuries such as slight bruising. Yet one EMT says that the police they have treated who have survived shots to their vests describe it as being hit with a baseball bat full force.


Thyroid cartilage
Cricoid cartilage
Thyroid gland
Trachea
Cervical (cupula, or dome, of) parietal pleura
Jugular (suprasternal) notch
Sternoclavicular joint
Apex of lung
Clavicle
Arch of aorta
1st rib and costal cartilage
Cardiac notch of left lung
Right border of heart
Left border of heart
sixty-six.org
Horizontal fissure of right lung (often incomplete)
Costomediastinal recess of pleural cavity
Oblique fissure of right lung
Costodiaphragmatic recess of pleural cavity
Oblique fissure of left lung
Costodiaphragmatic recess of pleural cavity
Spleen
Inferior border of right lung
Inferior border of left lung
Pleural reflection
Left dome of diaphragm
Pleural reflection
Gallbladder
Stomach
Right dome of diaphragm
Bare area of pericardium
Liver
Xiphoid process

Chest anatomy as it relates to plate coverage.

Plate armor is something else entirely. It's hotly contested whether injuries and fatalities are common when someone is shot while wearing plate armor. We've personally talked to experts and seen tests and studies that contradict each other.

In general, if you are wearing armor that is rated for the impact you experience, you are unlikely to suffer a major injury. Unless you're caught off balance, you're unlikely to be knocked back or over. Steel, in particular, is effective at transferring the force of the bullet across its large surface, minimizing the force that is passed on to the wearer. Ceramic armor defaces more dramatically, but this effect can be minimized with trauma pads; it should not cause grievous injury to the wearer.

This is not universally the case, however. People do suffer cracked ribs and other blunt force injuries when bullets strike them while they are wearing armor.

People are likely to experience the same impact differently according to body mass. Larger plates disperse impact over a larger area.

Penetration

Ballistics is a remarkably complex subject. We’ve spoken to a number of engineers and tactical enthusiasts about how to understand the risk of penetration.

Broadly speaking, rifle shots penetrate substantially more effectively than handguns or shotguns. They’re also considered substantially more deadly—though gun violence is a highly politicized subject and data is often skewed to support one position or another, and we’ve found contradictory reports about lethality claims according to caliber. The only exception to this rule is that .22 caliber rifles, which are common for small game hunting and for beginning shooters, are closer to handguns in terms of their penetration capacity than they are to other rifles.

Armor penetration is very different from overall power (the kinetic force transferred to the target by the bullet), which is different from “stopping power” (the ability of the bullet to neutralize a threat). Penetration is greater for faster bullets with a greater “sectional density”—that is, bullets that are heavier in relationship to their width. Thinner bullets are sharper and penetrate more effectively than larger bullets of the same mass. Armor penetration and stopping power actually work against each other: bullets that mushroom or fragment upon impact cause far more severe wounds, whereas bullets that maintain their shape more effectively are more capable of penetrating armor.

Most armor piercing ammunition works by using a steel or other hardened core that survives impact more effectively than lead. This ammunition is not generally available to civilians in the United States, although it is available to the military and police. This makes it less likely that militia groups and other non-state actors will be using it against demonstrators. It is not in common use by the police for a number of reasons: first, it involves greater risk of going all the way through the

Since most canisters are pyrotechnically deployed, it’s enough to simply put out the fire inside the canister. One rudimentary method, which does not require touching the canister at all, is to put a road cone over the canister and then pour water in through the hole at the top of the cone until it is doused.

A more refined method involves picking up the canister with gloved hands and putting it in a large water bottle or a bucket of water. In Chile and some other parts of the world where communities in revolt have honed their practices, extinguishing canisters has become a distinct role in street protests. People playing this role bring a water jug with a wide mouth, containing a little baking soda, dish soap, and/or vegetable oil—3 tablespoons of each to 1 liter of water. When a canister arrives, they drop it in the jug, and shake the jug while covering the top with one hand just enough to keep the gas from getting out. If you try this, don’t seal the bottle—you don’t want it to explode.

Failing all else, if you aren’t prepared to neutralize the canister, it could be enough to simply cover it with something like a cooking pot or an orange road barrel. Some gas will leak out, but this will diminish its ability to hurt people.

Being Prepared for What Chemical Weapons Do

In theory, riot control agents are designed to be as uncomfortable and debilitating as possible without causing permanent damage. They irritate the lungs, eyes, and skin. They are lachrymatory agents, causing your eyes to water. Your nose might run. You might have trouble breathing. You might be unable to open your eyes. Some chemical weapons take effect almost immediately; others can affect you minutes after exposure. Some continue to irritate you long after you move to fresh air; others dissipate faster. Some are more toxic than others; some can cause permanent damage. We’ll discuss the specific effects of each chemical separately. But in short: sometimes exposure to riot control agents can be painful and debilitating, especially when you’re directly exposed to them without protection. In other cases, they may be simply irritating.

Shortness of breath is a specific and common problem resulting from exposure to chemical weapons. When this is combined with the shock of getting gassed, the overall stress of the situation, and irritated lungs, some people may feel as though they are going to pass out.

Throwing Back Tear Gas Canisters

> “It is never polite to throw back the tear gas… But sometimes love Sometimes real love Is fucking rude.”
>
> Andrea Gibson, “Etiquette Leash”

Protestors regularly return tear gas canisters to those who have deployed them. Since tear gas is pyrotechnically deployed, most canisters are quite hot—hot enough to start fires or burn your skin. Anyone hoping to handle gas canisters should wear insulated work gloves made from fire-resistant material. Cheap hardware store gloves are not adequate; canisters have burned protestors through them. Synthetic materials, if not specifically designed to be fire-resistant, can melt into a person’s skin. Leather work gloves are often the simplest and best choice, though those who choose not to wear leather should be able to find heat-resistant synthetics.

People have also employed lacrosse sticks and hockey sticks to return tear gas canisters without touching them.

Police may employ pepper spray without putting on gas masks, but if they are going to gas an entire area, they will almost always put on masks or rotate in a new line of officers wearing protective gear. This is important: it means that if you keep an eye on the police, you should be able to tell in advance when they are preparing to gas you. It follows that, if anyone must be subjected to tear gas, it should be the people who are best equipped for it—the ones who deployed it in the first place. Of course, we’re not lawyers, and laws about which burning objects one is allowed to throw at the police likely vary by locality.

You should only throw canisters when you are aware of your surroundings and have an open space behind you. Before you throw a canister, take note of which direction the wind is blowing and where people are likely to need to go shortly, as well as where they currently are.

Neutralizing Tear Gas Canisters

In recent years, protestors around the world have been learning to neutralize gas canisters rather than simply tossing them back. These methods have the advantage of being a bit less confrontational.

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target and hitting someone else unintentionally, in what is called overpenetration; second, hollow point bullets (which mushroom upon impact) are more effective at killing unarmored targets, like the people that the police are usually trying to murder. The most common exception is 7.62x54r steel core surplus ammo, which has significant armor piercing capability, and anything in the 50 caliber range, which we are unlikely to see in domestic civilian conflict.

There are two types of bullets worth knowing about that are available to civilians and are likely to be carried by non-state actors who seek to harm demonstrators. First are steel-tipped (not steel-cored) bullets, generally referred to as “green tip” bullets. These were designed for the military to offer greater accuracy and penetration at long distance, but they are in common civilian use, especially in AR-15s. The second are the “+P” style of bullets, generally 9mm—the most common handgun round—though not all 9mm are +P. These are not designed for armor penetration, but pack a “hotter” load of more gunpowder that provides greater power and therefore more effective penetration.

Green-tipped .556 ammunition.

Both of these threats can be stopped by appropriate and available body armor, such as what that we recommend herein. It’s worth being aware of these threats in order to understand why you might need an appropriate level of armor. Older and cheaper soft vests might stop most 9mm rounds, but not the +P rounds that are commonly carried by self-defense and gun enthusiasts.

Ballistic Ratings

Armor can be tested against several different standards to determine its efficacy. For products available in the United States, the most common by far are the National Institute of Justice (NIJ) standards, which we use throughout this article. These were designed with US law enforcement in mind. Many other countries use the NIJ standards for armor that is available to civilians. There are other standards in use throughout the world, as well.

The US army does not use level ratings, instead offering specific armor items that must meet a certain threshold. These tests are not as simple as “this armor protects against handguns” or even “this armor protects against 9mm handguns.” The ratings designate the specific cartridge, down to its composition and how much gunpowder it is loaded with.

50 CARTRIDGES PER BOX 50 CARTUCHOS POR CAJA
9mm Luger+P
FULL METAL JACKET BALA ENCAMISADA
115
GRAIN GRANOS
CENTERFIRE CARTRIDGES
CARTUCHOS DE FUEGO CENTRAL
NON-CORR PRIMING™
DETONADOR NON CORR®
Aguila

9mm Luger+p ammunition.

Again, in short, if you are looking for soft armor, you want it to be rated to IIIA. If you are looking for hard armor, you want it to be rated at least III+, or “III special threat,” if it is to protect you against the common steel-tipped AR-15 rounds. Neither of these are officially part of the NIJ standards.

NIJ Standards

The NIJ standards are revised from time to time.

Current Standards

Level I: This level is no longer part of the standards. It protected against some .22lr (small game hunting rifle) rounds and .380acp (handgun rounds).

Level IIa: This protects against some handgun rounds, including some 9mm, .40, and .45 rounds.

Level II: This protects against more handgun rounds, including 9mm as well as some .357 rounds.

Level IIIa: This protects against nearly all handguns, including more .357 rounds and .44 magnum rounds as well.

Level III: This level is rated to stop most 7.62x51mm NATO rounds, a common military round. It is not rated against the AR-15, but will stop many AR-15 rounds (5.56 or .223, which are roughly the same).

Sprays tend to be used closer up. Outside of demonstrations, they are used to subdue individuals. Inside of demonstrations, they are often used indiscriminately, to disperse, intimidate, or incapacitate a crowd.

Tear gas and other chemical weapons are specifically *not* designed for punishment: they are not designed to be deployed against a trapped crowd or a restrained individual. Police use them this way regularly, of course.

To prevent the police from accomplishing their crowd control goals, we simply refuse to be crowd-controlled. This can necessitate a certain amount of advance preparation.

To mitigate the effects of chemical weapons, personal protective equipment is in order. Our guide to gas masks and goggles gets into this in detail, but the short version is:

- Wear long sleeves and long pants, minimizing the amount of exposed skin;
- avoid wearing contact lenses;
- avoid makeup and moisturizers and other skin creams, especially fat-based creams;
- wear a gas mask, or a half-mask respirator with goggles, or a wet bandanna and goggles and keep moving.

Umbrellas can block chemical sprays. On the day Trump was inaugurated president, in the fabled “umbrella charge,” a single umbrella protected dozens of anarchists as they escaped from a police kettle, eight felonies, and a years-long court case.

January 20, 2017: the umbrella charge.

In light or moderate chemical weapon attacks, it’s usually sufficient for a few people to deactivate or throw back the canisters while medics and others treat those affected by sprays. It’s also possible to keep moving, so long as this doesn’t interfere the goals of the demonstrators.

Unfortunately, the heavy use of chemical weapons will tend to thin out a protest of people who are less prepared. Having wet bandannas (stored in individual ziplock bags) or other PPE available for distribution can be useful to enable the crowd to stay around longer.

- OC, the common “pepper spray” that is made from chile peppers; and
- PAVA, a synthetic form of OC that appears to act in very similar ways.

We will largely conflate these two throughout this article, as we’ve had a hard time identifying any significant distinction between them.

The first self-defense sprays were actually filled with CN gas, but OC is generally more effective at disabling a target. There are sprays filled with CS, CN, and OC. There are also tear gas munitions filled with OC and PAVA.

For the ostensible purposes of crowd control, OC (or PAVA) is the most effective tear gas agent. It is the fastest acting, the most debilitating, and the least toxic, and its victims recover faster. CS gas is in second place; it is more traditionally used, and the most widely available.

OC
5000
RED PEPPER SPRAY
MEGA
Weitstrahl
SSG-9

Common pepper spray.

By any measure, no other tear gas agent besides OC or CS has any use even from a statist point of view except to punish and poison people. They are outdated and cruel technologies. We don’t say that in order to ask for sympathy or to appeal to the moral judgment of the state, but simply to point out that the cruelty is the point.

Tactical Considerations

Chemical weapons are used for a number of tactical purposes. As we’ve found with impact munitions, police employ them in many ways that they were never designed to be used. In general, tear gas is designed to control the movement of crowds, or to disperse crowds. Tear gas clouds are meant to discourage people from occupying particular areas. Police can use tear gas to direct a crowd much the same way that lines of riot police can: most people will avoid the gas and will move in the direction of clear air. The same crowd control effect can be done, on a smaller scale, with pepper-balls and the focused remote deployment of chemical weapons.

Level IV: This level is rated to stop 30.06 (thirty-aught-six) armor-piercing rounds—the rounds fired by WWII-era battle rifles, which remain common for hunting.

The Coming Standards

The new NIJ 0101.07 standards will likely be released at some point soon. This revision will address the major holes in the current system, such as the gap filled by III+. It will replace the numeral system with two separate categories: HG (handgun) and RF (rifle). HG will have two levels HG1, which will map to the existing level II, and HG2, which will map to the existing IIIA. RF will have three levels: RF1 which will map to the existing level III, RF2 which will fill the hole currently met by III+, and RF3 which will map to the existing level IV.

Ballistic Helmets

Please read our full article about helmets [pg. 16].

Most ballistic helmets are rated to the IIIa level and are designed to stop handgun rounds. A few newer military helmets can stop some rifle rounds, sometimes, from long distances. There are also rifle inserts available for some helmets to increase the protection level of the helmet, although these are not in common use, as most soldiers seem to prefer weight reduction to an extra level of protection.

IIIA glass visors are also available, which attach to helmets and protect the eyes. These are made of thick polycarbonate, the same plastic used in the manufacture of bulletproof glass.

A ballistic shield.

Ballistic Shields

While we will cover protest shields at greater length in a future article, it’s worth touching on ballistic shields: shields designed to protect the user from gunfire.

Most ballistic shields are rated IIIA for handgun protection or IV for rifle protection.

They can weigh anywhere from 15 to 40 pounds. It’s very difficult to wield them in the ways that an ordinary shield is wielded.

While they’re somewhat common equipment for police, they are not generally used by the military or militias, nor are they generally applicable to self-defense or community-defense situations. They seem to be chiefly useful for raiding buildings.

A Note on Cut Resistance

Cut-resistant gloves and sleeves are available and affordable, but they are generally designed for the kind of incidental contact with sharp knives one might experience in a commercial kitchen. These are generally made of aramid (Kevlar) or UHMWPE (Dyneema) fabric, though some also contain woven wire. Cut resistance does not translate to stab resistance. A truly cut-resistant sleeve would be useful for defending against knife attacks, but the testing we’ve seen has not led us to believe the current products would be much help against determined attackers rather than workplace accidents.

Cut resistance is measured in the USA by the ANSI standards rating scale, running from A1 to A9, and in the European Union with the CE/EN standards rating scale, running from A-F (previously, 1-5). The ANSI standard rates to a higher level of cut resistance than the CE/EN standard.

May we live to see a better future.

Chemical Weapons

As with all many other less-lethal weapons, the distinctions between categories of chemicals are actually quite blurry.

Conventional parlance divides chemical weapons in two categories: tear gas and pepper spray. While these distinctions exist, they’re not clear-cut. If we imagine “tear gas” as clouds of smoke or dust and “pepper spray” as chemical sprays, this is really a question of methods of dispersal, not the actual chemicals being used.

We will discuss seven different chemicals herein. Although something like fifteen varieties have been developed, we will focus on the most common ones that are either known to be used against demonstrators or at least widely suspected of being used thus. Of those seven, five of them are usually dispersed as gas, while two usually appear as a chemical spray. But it’s possible for almost any chemical to be dispersed by almost any means, and we have seen quite a bit of crossover.

MADE IN
U.S.A.
SABRE
CS TEAR GAS/RED PEPPER
PERSONAL DEFENSE SPRAY
CAUTION: SKIN, EYE AND
RESPIRATORY IRRITANT
CONTENTS UNDER
PRESSURE
SEE OTHER
WARNINGS
ON BACK LABEL

A civilian pepper spray.

The five tear gasses, in brief, are:

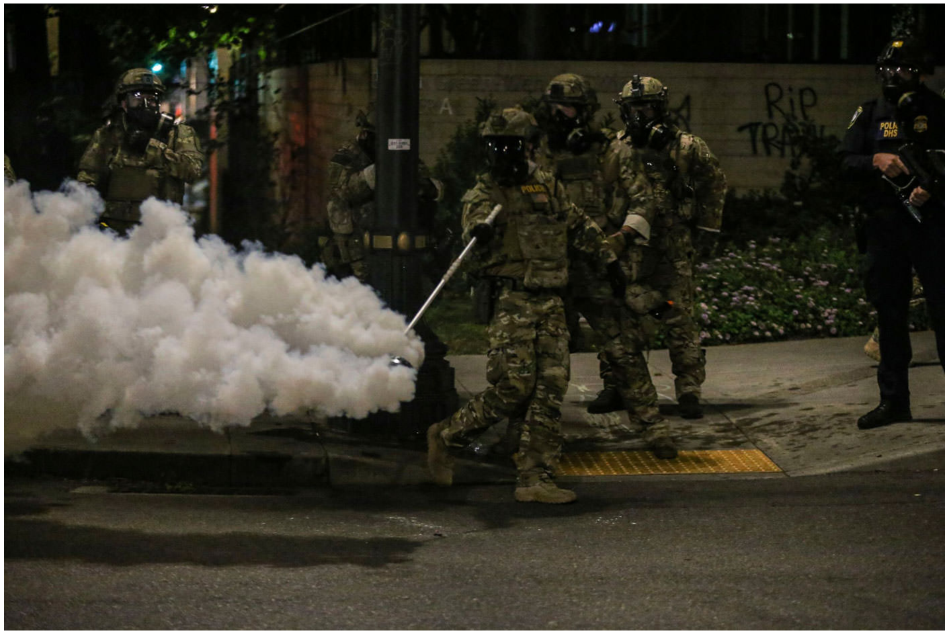
- CS gas, far and away the most common tear gas;
- CN gas, an outdated tear gas that is more toxic and less effective, but is still in production and commercially available;
- CR gas, which is sometimes called “fire gas,” known for being incredibly hard to decontaminate—this makes your skin burn even worse than other gasses, and is in suspected use but not listed as commercially available;
- DM gas (or Adamsite), the nearly-mythical “vomit gas” that the police are suspected of using, though there is not yet hard evidence of its use;
- and MPK gas, which to our knowledge is only used in Russia but might be of interest to some readers.

The two pepper spray chemicals are:

Candles

A hundred years ago, when chemical warfare was first emerging, some poisonous gasses were dispersed by “candles,” which would burn and release gas. Functionally, this is the same thing as a modern tear gas grenade, which uses pyrotechnics to disperse chemical powder; the phrase “tear gas candle” could be used to describe any pyrotechnic tear gas canister.

Yet in the summer of 2020, we saw either police or federal agents walking through the streets of Portland holding a burning object at the end of a stick. This looked, for all the world, like a censor at a Catholic mass with smoke pouring out of it.



Officers distributing tear gas in Portland, summer 2020.

We don’t know for certain whether this was a chemical agent (probably) or inert smoke, but it feels noteworthy that the only tear gas we’ve come across that was designed for dispersal in “candles” like this is DM gas, the vomit gas that protestors believe is in use in Portland. This would mark a major escalation in the form of chemical warfare employed against protestors.

A Demonstrator’s Guide to Understanding Police Batons

And How to Protect against Them

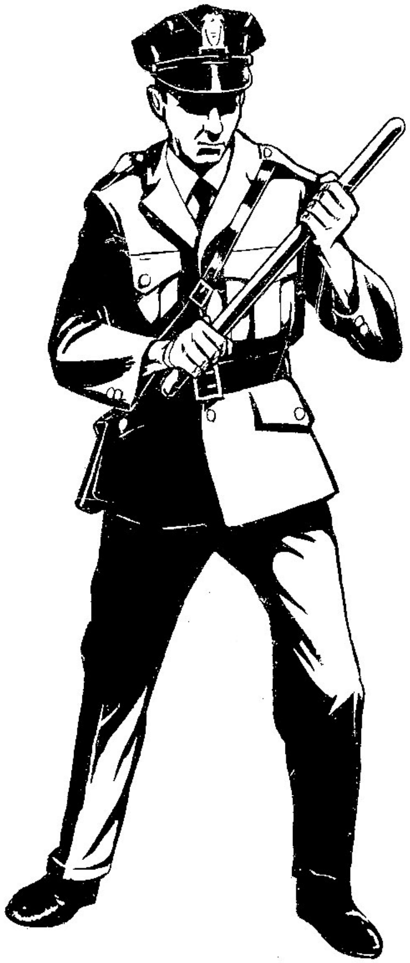
This guide details the kinds of batons that police use, how they employ them, what kind of damage they can do with them, and some of the ways that demonstrators have historically protected themselves against baton attacks.

Cops often hit people with batons. Looking at footage, you’d think that the prospect of doing so is what gets them out of bed in the morning. Historically, batons are the bread and butter of policing to such an extent that the baton is often referred to as the officer’s “badge of office”—though lately, Tasers have supplanted batons as their go-to weapon.

Instructional videos and pamphlets give the false impression that police are martial arts masters who carefully study all the ways to injure people with big wooden sticks. If you go to demonstrations, though, you generally see the same few moves over and over. They swing wildly at people they already have on the ground. They jab people with the end of the baton, often without provocation. They hit people with wild overhand swings, often in the head—although in theory, they’re not supposed to do that unless they’ve been authorized to employ lethal force. They put one hand on each end of the stick, hold it horizontally at chest level, and shove people back while grunting “move”—often regardless of whether the people they are shoving are able to move and regardless of whether they were already moving.

Fundamentally, batons are compliance tools. They’re not specifically designed to kill or injure people, though they are capable of doing so. They are designed to hurt people in order to force them to comply with an officer’s command. Of course, police often continue to use them after a subject has complied, just to emphasize the power relation between the subject of the state and the mercenaries it employs.

Not everyone loves batons. Some officers don’t carry batons unless ordered to do so by their department. One ex-cop on YouTube points out that the overlap of the Venn diagram of “effectiveness” and “legality” is very small indeed. However, police are rarely held to any standard of legality. Batons are often the primary means by which police seek to control space in close quarters, especially against demonstrators.



This is the cover illustration from a 1967 law enforcement training manual published by the FBI and the United States Department of Justice. This is how the authorities want police to see themselves.

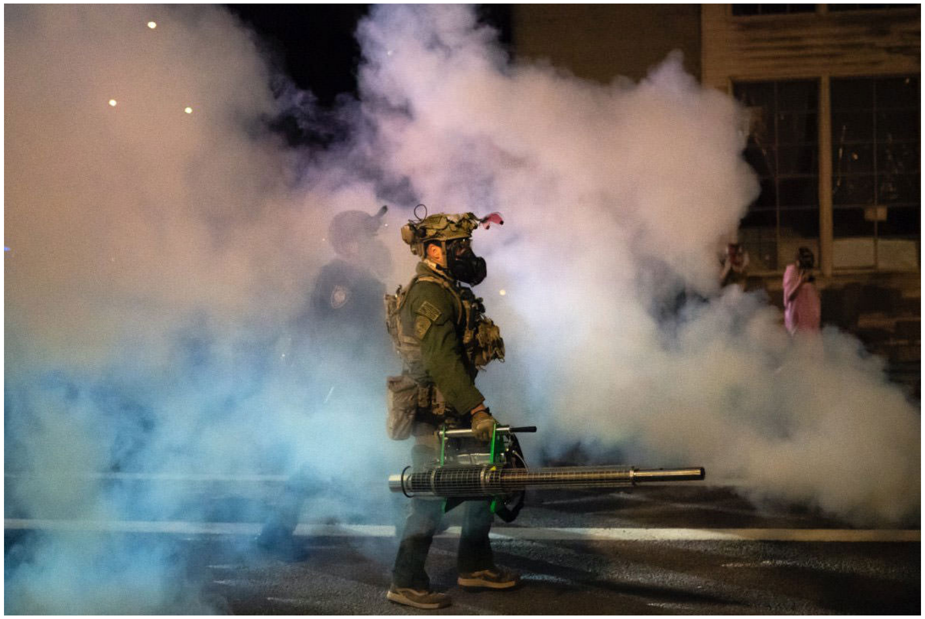
During protests, police use batons to accomplish a wide range of tasks. There are baton charges in which large numbers of police charge, swinging and shoving, to disperse a crowd and incite fear. Officers use batons to clear a path for a snatch squad to enter a crowd to carry out arrests. Officers use batons to advance a police line, shoving people to keep them moving, often while pepper-spraying them for good measure. Officers use batons to injure people once they have them immobilized on the ground, out of pure vengefulness or cruelty.

There is a misconception that batons are only used against individuals who are not complying with police orders. In fact, police employ them against anyone they suspect might hinder them from accomplishing whatever their goal is, regardless of whether the target is breaking any laws or failing to comply with their orders.

chemicals; at least one model has an effective range of 45 feet. Portland police have been seen to conceal backpack chemical foggers inside an unmarked black backpack with a spray nozzle attached to a hose protruding from the bottom.

There are also devices that look like a cross between a fog machine and a leaf blower that are gas-powered and are designed to fill large areas with poison. Like the backpack foggers, these are generally designed for use in prisons, not at demonstrations. As we’ve seen recently, however, riot police will often use any weapon available to them.

Finally, chemical weapons are sometimes mixed with water and dispersed through fire hoses or water cannons. None of us had seen this method in use in the United States until the 2020 protests in Portland. Chemical burns on a nearby tree were consistent with chlorine poisoning, which could be the result of expired chemistry. This means of chemical weapon dispersal has been used in Hong Kong, Thailand, and Turkey; it is presumably possible in any country that uses water cannons against demonstrators.



Federal troops poisoning downtown Portland with a fogger, summer 2020.

Sprays and Foggers

In addition to firing canisters that release chemicals as smoke, police also spray people directly with chemicals with handheld devices. The two chemicals we’ve found in our research are OC (pepper spray) and CS (a tear gas), but almost any chemical agent can be aerosolized and sprayed. Depending on the manufacturer, the chemical irritant, and the spray pattern, these can employ any number of propellants, such as compressed air, nitrogen, or the refrigeration chemical ominously named 134a. There are numerous spray patterns, from the simple “stream” pattern to cones, fog (or “vapor”), and even foam.

Chemical sprays, unlike pyrotechnic dispersal methods that disperse a powdered irritant, generally aerosolize a liquid form of the chemical. This can be water-based or oil-based; consequently, chemical weapon protection should be rated against oil-borne particulates (P100 filters instead of N100 filters). Foggers use a liquid formulation as well, but aerosolize this liquid pyrotechnically (the way a fog machine does) rather than by using an aerosol gas.

Chemical sprays come in a range of different concentrations and it would be difficult to anticipate which is ones law enforcement are utilizing without research. To make matters more complicated, the strength of OC (the most common sprayed irritant) is notoriously difficult to identify. Manufacturers’ claims are not regulated, and there are many different types of capsaicinoids that might be present in a given variant of OC gas. There is probably internal consistency within each manufacturer’s line of weapons, but that’s about it. One manufacturer’s 2% spray might be more powerful than another’s 4% spray. Those numbers are almost meaningless on their own.

Small handheld canisters with a button on top seem to be accurate from 10-12 feet, while larger canisters with a trigger assembly seem to be accurate up to 15-20 feet, although this differs from manufacturer to manufacturer. Many spray systems also contain visible or UV reactive dyes to mark targets. UV dye is particularly common in civilian self-defense spray, while police in Seattle and other cities are known to use visible dye to mark demonstrators for arrest.

There are larger canisters that operate on the same principles as the smaller ones. These often look more like full-size fire extinguishers. Then there are backpack devices with separate spray nozzles and tanks—the “Ghostbusters” variety, as some have called them. These can operate with either powder or liquid

Police use-of-force guidelines generally dictate that using a baton to strike major nerve centers on extremities is “intermediate force,” while striking someone on the head, neck, or clavicle is “deadly force.”

Types of Baton

We’ll look at three types of batons: the fixed-length baton (or “straight stick,” including the riot baton), the collapsible baton, and the side-handled baton.

Riot Baton

A riot baton is a style of “straight stick” baton. The most common example is 36” long and 1.25” in diameter, made of polycarbonate or hardwood—usually hickory, but sometimes cherry, ash, or another wood. Some police are adopting thicker sticks, such as a 1.5” diameter baton, to apply more force. If you hold a 1.25” baton and a 1.5” baton in your hands, the difference in weight and girth is greater than you might have anticipated.

The thicker sticks are not inherently better weapons, but they are sturdier. We put sticks of both thicknesses into the hands of an experienced stick fighter, who was able to break the 1.25” baton against plywood shields but not the 1.5” batons. This person applied substantially more force than the average officer would be able to bring to bear.

Wooden batons are either clear-coated or painted black. Polycarbonate sticks are black. Riot sticks come with a variety of grips, such as rings or grooves carved into one or both ends, or a crisscrossed “knurling” grip. Some of these grips are designed to offer better retention if the baton is pulled, while others are intended to offer better retention in the case of twisting motions. Most come with a simple leather thong for retention. A well-trained officer is supposed to hold the thong in such a way that he can let go if the stick is grabbed and pulled into a crowd, but many cops hold them incorrectly, in such a way that if the baton is pulled, the officer will come with it whether he wants to or not. Polycarbonate sticks deliver more impact than wooden sticks but are substantially more expensive. Some police complain that polycarbonate sticks can warp in the summer or shatter in the winter.

The riot baton is used to strike people, jab people, and shove people. Broadly speaking, police use batons to strike people who are resistant or combative, while they use batons to shove people who are in their way, approach too closely, embarrass them, or look like they can be intimidated into leaving an area. They jab people for both of these purposes. In crowded environments, police are trained to fight with one hand on each end of the stick, for weapon retention.

Officers think about weapon retention in crowd situations quite a bit. Their training focuses on this. They are afraid that someone might grab the baton and use it to control the officer.

It would be hard to overstate the role of riot batons in intimidation. Police wield large sticks when they want to look scary; in some cases, they employ wooden batons to contrast with their uniforms, with the intention of inspiring fear. They hold them in two hands in police lines to look unapproachable. They use them unpredictably in order to keep people on edge.

The chief difference between the riot baton and the traditional fixed-length baton is that the latter is 26” or shorter. Many departments employ tapered sticks for everyday use, with a wider striking surface at one end and a smaller, more controllable handle. These provide greater leverage for striking blows. Learning to distinguish between these types of batons can help demonstrators figure out what tactics police are considering: if they are wielding the longer riot batons, they expect to employ more violence.

Extendable Baton

More and more police departments are using extendable batons as the everyday carry baton on their service belt. These batons are also called collapsible batons, or ASPs after the brand ASP. Extendable batons usually measure between 16”-31” with 16”, 21”, and 26” being the most common lengths. Most of them are made of steel, while some lighter-weight models use an aluminum alloy. The grip can be foam or plastic, or use some other texturing. Closed, they’re roughly the size and shape of a small lightsaber and they look a bit like one on a belt. Cops open them by flicking them and letting centrifugal force slide the segments into place. Most are held open by the friction of each steel segment against the next and can only be closed by slamming the tip onto concrete or some other hard surface. Some newer models have a push button lock that makes them easier to close and more effective for jabbing as well as swinging. One of the other reasons that police are moving to the push button lock is that a baton that is

is released, the fuse is ignited. While fuses could be of varying length, we have found two second delays to be common: a 1.5-second delay before the fuse is ignited, then .5 seconds for the fuse itself. On at least some models, the fuse assembly ejects itself before the payload is ignited so that it does not become a projectile.

Some grenades come with additional safety clips that prevent the fuse from being pulled while the grenade is being carried. Some come with water-resistant bodies for high-humidity environments. Some, particularly flash-bangs, are reloadable. People have reported seeing police combing the area after protests and picking up certain spent munitions. It’s possible they are doing this to conceal the use of some particularly egregious weapons (such as DM gas), but it’s also possible they are recovering reloadable grenades.

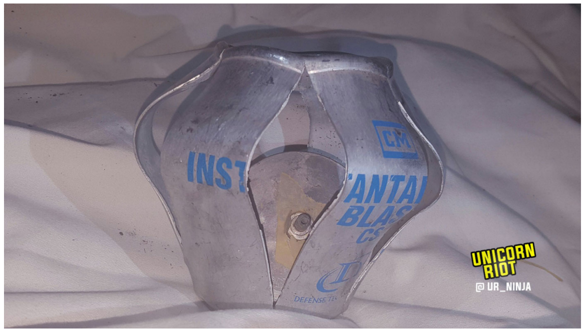
Grenades can also be “command initiated” instead of lit by a fuse. This system seems to be more common in tactical situations, such as house raids, rather than at demonstrations that are more dynamic. This system involves attaching a tube to the grenade to allow for instantaneous, remote detonation.

LEGAL
OBSERVER
ACLU

A federal officer using a fogger to assault a legal observer from the American Civil Liberties Union in Portland, summer 2020.

creating a fire inside the canister that releases the chemical agent as smoke. These canisters are very hot and can spark and start other fires.

Another dispersal method, used more often by OC canisters than CS canisters, is aerosol dispersal (sometimes called “flameless expulsion”). Releasing something more akin to a mist than a smoke, these are more commonly used indoors, where pyrotechnic canisters would be less convenient. As best as we are able to determine, these are generally not used as much outside because they produce less dense concentrations of chemical agents.



An instantaneous blast grenade.

Finally, there are instantaneous blast canisters, which explode all at once and release their payload as a powder. These are designed for inside or outside use, but as the dust is easily dispersed by wind, they are intended primarily for use against dense crowds of people, when pyrotechnic grenades are less effective, either owing to throwback potential or the risk of starting unintentional fires. These canisters are easily identified after the fact because they are split open along the sides.

Gas dispersal canisters are often designed to separate into a number of sub-munitions, like the “triple chaser” from Defense Technology that splits into three smaller tear gas canisters. This is done to make it more work for us to throw them back or douse them with water.

Less-lethal grenades are generally equipped with fuses like any military grenade: the user pulls a pin, which makes it possible to release a lever that is gripped in the hand. Once the lever

CM
TRIPLE CHASER CN
DEFENSE TECHNOLOGY

The “triple chaser” from Defense Technology that splits into three smaller tear gas canisters.

closed on concrete will quickly end up with a roughed up tip, which will occasionally cut those who are struck by the baton.

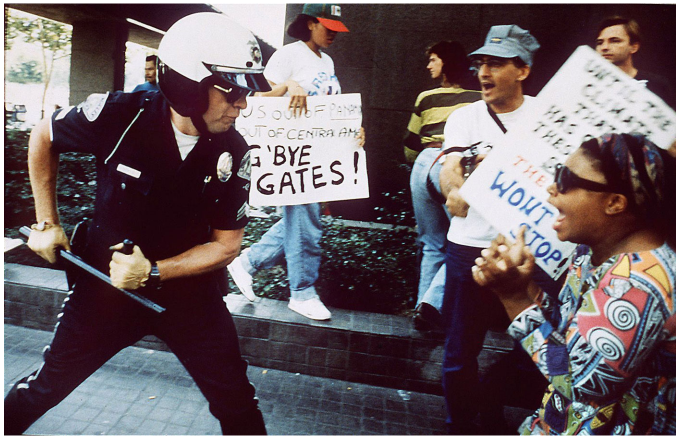
Police complain about extendable batons breaking when they are used to beat people all day—at unruly demonstrations, for example—and many cops who make heavy use of their batons treat them as disposable. Police literature explicitly mentions the intimidation factor involved in opening an extendable baton as an advantage of the weapon.

Extendable batons are somewhat common for civilians interested in self-defense. We’ve seen them most commonly among those who are in violence-prone situations and prefer not to defend themselves with bladed weapons or firearms. Their legality varies from state to state.

Side-Handled Baton

These are straight batons with a short handle protruding from the side about six inches up from the base. This is the Western adaptation of the tonfa, a Japanese weapon—though the tonfa wielder usually employs two of them. Side-handled batons are considered a more “defensive” weapon; they became common after the bad media exposure resulting from all the police violence against civil rights protestors in the 1960s.

Cops can hold these batons by the side handle, so the length of the baton runs down the forearm to the elbow. This position is used for blocking blows and executing pain compliance holds. They can also hold them at the base, so the side handle serves as a sort of hilt that could stop counter-strikes. Most famously, these batons were carried by the Los Angeles Police Department and employed in the widely viewed assault on Rodney King in


'BYE GATES!
THE WON'T STOP!

A police officer employing a side-handled baton to attack demonstrators during the protests against the beating of Rodney King.

1991. That episode shows that this “defensive” baton is just another stick, used the way police have always used blunt impact weapons, and its reputation as “defensive” is just a matter of branding.

While side-handled batons are not designed to use the side handle as the point of impact, many of us have seen police hold them by the end opposite the handle and swing them like hammers. This concentrates more of the weapon’s force at a single point, inflicting worse injuries.

The Daily News

Twenty-five years after the Rodney King uprising of 1992, a former Los Angeles Police Department officer fondles his side-handled baton as he recalls how police behavior contributed to the unrest.

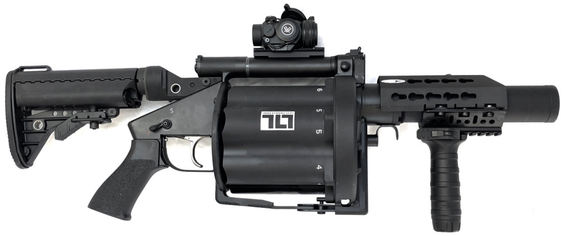
Over the past two decades, side-handled batons have fallen out of favor as the everyday carry batons for police in the United States, replaced by extendable batons. Many cops disagree with this transition; some still choose to carry their beloved “PR24”—a generic name for a side-handled baton named after the standard Monadnock PR-24 baton, which is 24 inches long and made of polycarbonate.

Common Injuries

We have not found many studies on the lethality of police batons, but it’s no secret that hitting people in the head with sticks can often kill them. Most of the information we were able to find was published in the UK. This is not surprising: their police often do not carry firearms, instead injuring or killing people the old-fashioned way, by bludgeoning them.

According to one doctor, a large number of baton injuries are fractures of the forearm resulting when a person raises an arm to protect their face. Blows to the head and, to a lesser degree, the chest are far more dangerous than blows to limbs, however, as these can cause internal brain bleeding, concussions, and fractures.

stocks and look more like traditional rifles, while most of what we’ve seen in the US are “tactical” style guns with pistol grips in addition to stocks as well as vertical fore grips—a style that is not legal for civilians without special permission.



A multi-launcher.

Launchers can also be mounted under the barrel of a rifle, rather than operating as standalone devices. This style is in common use in military situations but does not seem to be common among law enforcement.

Canisters and Grenades

For the purpose of this article, we are distinguishing “canisters,” designed to be fired from launchers, from “grenades” that are designed to be thrown by hand. In reality, there is no such clear distinction. Some weapons are designed to be thrown or rolled by hand, while others are designed to be loaded into multi-launchers—but some are designed for both.

Grenades are often used to disperse chemical agents and/or impact munitions, particularly rubber balls. Other grenades are “distraction devices,” generally referred to as flash-bangs. Many combine these functions.

We’ve found at least three body styles for police grenades. There is the ball grenade, which looks like a classic baseball-style military grenade, designed to be thrown or rolled. These often contain rubber ball impact munitions, possibly paired with chemical weapons, while others are traditional pyrotechnic tear gas grenades. There are the “low roll” body grenades, which are cylinders with large hex-shaped ends that minimize the distance the grenade will roll. Then there are the regular canister grenades, which appear to be the most common style. These can be of any diameter, but 37/38m, 40mm, 45mm, and 60mm seem to be the most common.

Gas grenades and canisters can disperse chemical agents through a number of methods. The most common is the classic pyrotechnic dispersal, which works by range of devices, not just grenades. These are also sometimes called “riot guns” or “less-lethal launchers,” but “riot gun” is often used in the US to describe lethal “riot shotguns.”

There are two common calibers of multi-launchers, 37mm and 40mm. Traditionally, 40mm launchers are seen as “military” and 37mm launchers as “civilian,” but the police employ both and the differences between the two seem to be minor. It can be legal for a civilian in the United States to own a 37mm launcher so long as the munitions they use with it are not anti-personnel; flares and fireworks are legal, while baton rounds are not. There are also 38mm munitions, and most 37mm less-lethal launchers we’ve seen are advertised as firing 38mm munitions as well. 38mm munitions might be more common outside the United States.

All 40mm grenades used in protest situations seem to fit the “40x46mm” NATO standard for low-velocity grenades, which is the standard used for handheld launchers, unlike the 40x53mm high-velocity grenades that are generally fired from mounted and crew-served weapons (i.e., guns that are designed to be operated by two or more people at a time). The ammunition is not interchangeable between these systems.

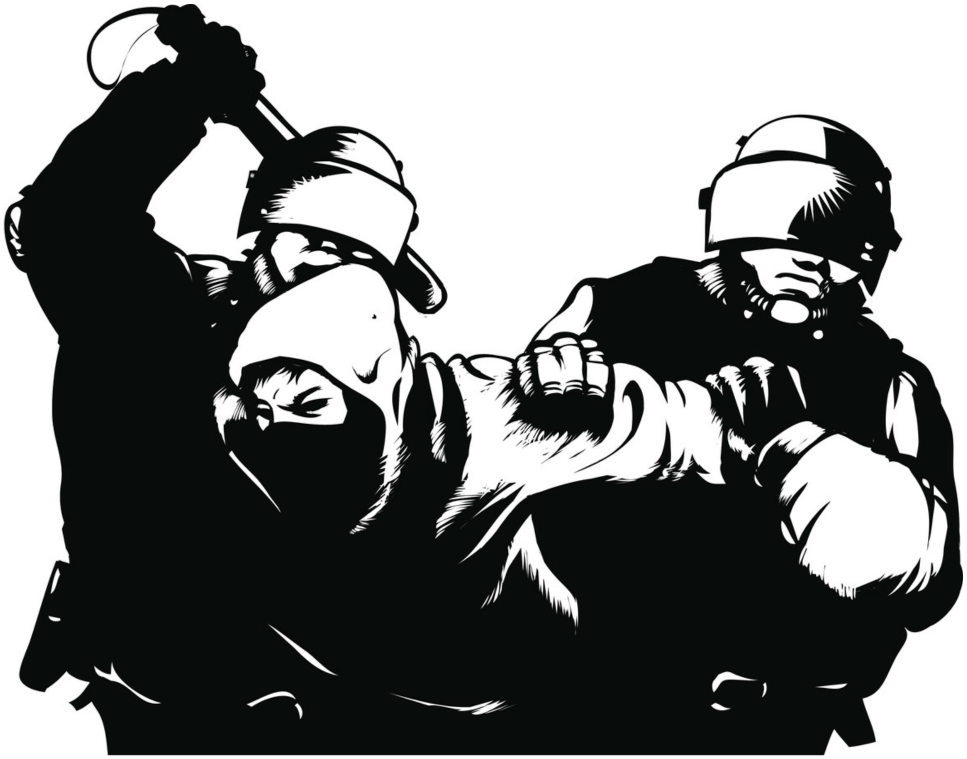
Many multi-launcher projectiles are fired with black powder, rather than more modern gunpowder, which causes sparks and smoke. This is done because these projectiles are more fragile than most modern ammunition. Some are available in “smokeless” models that, presumably, use EC smokeless powder, a slightly more modern variant of black powder that produces less smoke.

When people report with shock that police who work at public schools have “grenade launchers,” this likely means multi-launchers. The police probably don’t plan to fire live grenades at students; rather, they plan to poison them with chemical weapons that are explicitly banned for use in war by the Geneva Convention.

Pistol-style launchers exist, but are generally designed only for muzzle blasts.

Full-size launchers are usually either breech-loaded single-shot guns (in which the barrel hinges away from the handle and a single round is inserted) or drum-fed versions that look like gigantic revolvers. These revolvers are usually advanced by a pump action, rather than a trigger as in a conventional revolver. These tend to hold between 4 to 6 rounds, depending on the model. Some are rifled to spin projectiles for better accuracy. Internationally, many have wooden

Broken ribs are common in situations in which police are swinging from the side into the target’s torso. Some of us have seen people end up with fractured hands and wrists from trying to catch baton blows. Two-handed stabbing strikes targeting the diaphragm can cause loss of breath; combined with shock and stress, these can make people lose consciousness or vomit.



Defending Yourself from Batons

To avoid sustaining bludgeoning damage in melee range, you have three basic options.

- You can stay out of melee range.
- You can prevent your opponent from seeing you clearly enough to strike you effectively.
- You can protect yourself and others from the blows directly, most likely via some sort of barrier.

Police use violence for at least two purposes: to control space—dispersing us, herding us, preventing us from reaching our destination—and to subdue individuals. Sometimes, the simplest solution is to run away from a cop with a stick: to stay out of melee range by retreating. In other cases, the consequences of this approach are not worth it. You may not wish to abandon other demonstrators. You may not wish to abandon the objective that brought you out into the street in the first place. You may not wish to positively reinforce the assumption that all it takes to keep people in a condition of fearful servility is to brandish sticks at them every once in a while.

So another way to stay out of melee range is to compel the police to retreat, or at least keep them from closing the ground between you. Historically, protestors have accomplished this by using projectiles of their own—bottles, rocks, paint bombs, and the like. This *can* be effective, but its efficacy and advisability is situational—it depends on the objectives of the police and the factors limiting what they can do. Police in the United States are better equipped and less likely to back down than police in many other countries, which is one of the reasons demonstrators rarely employ this strategy here unless the stakes are high. When everything is on the line, however, people sometimes summon up the courage to do unbelievable things.

Another solution to this problem is to build barricades. To serve their purpose, barricades have to be suited to blocking the particular threat that they are intended to address; obstructing vehicles and hindering officers on foot are two very different objectives. Historically, some demonstrators have made barricades more difficult to pass or dismantle by setting fire to them; but once a barricade is burning, it will eventually consume itself, unless there is an unlimited supply of fuel. Common-sense fire safety measures apply; so may local laws. Even if it doesn't impede foot traffic, the right kind of barricade might give officers something else to focus on, which is another way to keep them at a distance. As long as the situation is unpredictable and they have to keep an eye out in all directions for new developments, they may choose not to engage in a way that would leave their backs open.

The second strategy is to prevent police from being able to see you clearly enough to hit you accurately. Protesters have employed shields, umbrellas, smoke bombs, and sometimes even fire extinguishers to this end. We've seen protestors carry banners that are so tall that they block the view of officers on the other side —though even if you add eyeholes, these will also prevent most protestors from

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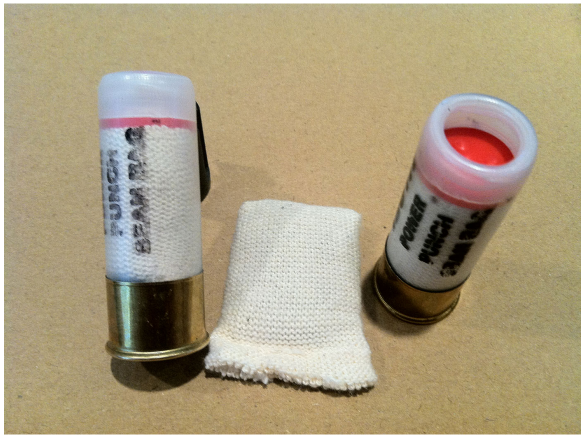
comrade in Cleveland reports that these were being carried primarily for intimidation purposes, while the same department fired actual less-lethal rounds out of 18" barrel shotguns instead. The longer the barrel of a firearm, the more accurate it will be, but also the faster the projectile will go and more powerful the impact will likely be.[6]

Barricade rounds can be launched from a 12-gauge shotgun. They are not designed for firing directly at people. Despite this, since they are loaded into less-lethal shotguns, officers have killed multiple people with direct shots, presumably unintentionally. Relatedly, "breaching rounds" are designed to destroy locks and doors. These are shotgun rounds generally comprised of small metal shot, or metal powder, often lead, suspended in a medium like wax. The idea is that the round maintains rigidity until impact, expels energy into a hinge, lock, or doorframe, then fragments into a powder after impact.

With both barricade rounds and breaching rounds, the injuries result from the initial impact, which can transfer a lethal amount of energy into a target.



12-gauge beanbag round.

Several manufacturers of police munitions sell "grenade launching cups" that attach to the muzzle of 12-gauge shotguns, enabling police to launch grenades that are ordinarily thrown by hand. These are used by attaching the cup to the end of the barrel and loading special launching cartridges into the gun.

37mm and 40mm Launchers

The majority of riot munitions—including tear gas canisters, muzzle blasts, baton rounds, flash-bangs, and marking rounds—are fired from devices designed as grenade launchers. For the purpose of disambiguation, we're going to refer to them as "multi-launchers," as some sites call them, because they fire a wide

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[6] One chart we found compares a 22-inch barrel with a 28-inch barrel, noting that a round will fire at 1304 fps from the 22-inch and 1331 fps from the 28-inch, but this may not map to the difference in velocity of a beanbag round.

12-Gauge Shotgun

A large number of less-lethal projectiles are fired from 12-gauge shotguns. Beanbag rounds are the most common, but rubber ball rounds exist, as do baton rounds, as do muzzle blasts—a means of dispersing chemical agents directly from the barrel of the gun, shooting a cloud of dust 10-15 feet or so.

LESS LETHAL

A *"less lethal" shotgun.*

Note that the title "riot shotgun" does not apply to dedicated less-lethal shotguns but instead describes shotguns that are designed for defensive fighting, in contrast to a hunting shotgun for hunting or a tactical shotgun for offensive combat.

We have not found evidence that there is any oversight in the US that requires police departments to use dedicated less-lethal shotguns, though most departments do. Dedicated less-lethal shotguns are generally designated by the use of bright orange, red, or other color furniture (i.e., the outer parts of a firearm) on the stock and/or the fore end (the part you pump on a pump-action shotgun). While some models of shotgun are sold specifically for less-lethal use, many departments retrofit existing models to color-code them instead. This makes it hard to offer specifics about what shotguns are in use.

Most police shotguns are pump-action shotguns, as these enable them to fire a wider variety of ammunition. A semi-automatic shotgun usually uses the blowback from the shell to chamber the next shell, and that amount of force is irregular if different types of ammunition are used, causing feeding problems and jamming.

Most police shotguns appear to have either 14" or 18" barrels. It is illegal for a civilian to own a 14" barrel shotgun without filing federal paperwork for a short-barreled shotgun. Most pump-action shotguns hold between 4 and 8 shells. One less-lethal 18" shotgun we found held 6+1: that is, six shells in the magazine tube and one chambered.

However, we have received reports on the ground of police using full-length hunting shotguns, presumably with barrel lengths of 26 or 28 inches. One

seeing what the police are doing, too. Police hate not being able to see what's going on; this can cause them to step back and regroup, but it can also provoke them to escalate senselessly. If they can't see clearly, officers may simply strike at random—which may not be an improvement.

December 2020: Demonstrators in Portland employ a fire extinguisher and projectiles to compel the withdrawal of police who had arrived to carry out a violent eviction.

Finally, if nothing else serves, there is the possibility of protecting directly against baton blows. This usually involves armor, shields, mobile barricades, reinforced banners, or other barriers. Armor designed to protect against bludgeoning impact is generally designed with a "shell/soft" framework: a hard shell disperses the impact of the blow across a greater surface area, while soft padding absorbs that impact. Nowadays the shell is usually some kind of plastic, though steel was used traditionally and wood may serve in some cases; likewise, the soft layer is usually comprised of foam, though in the past, padded clothing might have served. If you are considering wearing any sort of armor, start by thinking about a helmet. The more normalized wearing helmets becomes, the harder it will be for police to target individuals for choosing to protect themselves.

Head injuries are serious business, and repeated concussions can be exponentially dangerous. Even if you feel all right after experiencing a head injury, the risk of sustaining subsequent blows to the head increases significantly. People in the streets who suffer a blow to the head should consider themselves at heightened risk for up to a week afterward; a second concussion following an unhealed first concussion can lead to death. Consider avoiding danger for a week.

Sports armor is readily available from secondhand stores. By and large, it is designed for protecting against the same kind of impact police batons can inflict. Hockey and lacrosse pads are available used; they're light, low-profile, and are designed to maximize mobility while protecting vital areas. Soccer shin guards can also serve as forearm guards. Being struck by a baton is never a good experience, but armor can mean the difference between a broken arm and a hairline fracture. Choose where to focus on protecting according to your threat model: knees are common targets for less-lethal munitions, groins are vulnerable areas, forearms are often used to block baton blows, the chest and abdomen are often vulnerable to jabs from batons or blows from impact munitions. The more you want to be able to stay on the front lines regardless of what happens, the more you should consider what kinds of armor will protect you.

Historically, some movements have employed “padded bloc” techniques to defend crowds against police violence—building incredible costumes out of foam, inner tubes and other inflatable swim devices, and whatever other large soft things they can access. This severely limits individuals’ mobility, but it may hinder police from breaking up a crowd. It can also create striking optics. The most famous example of this approach is the Tute Bianche in Italy.

Shields can be somewhat more flexible, tactically speaking. A person with a shield can often protect the people on either side of them as well. A group of people with shields can form a shield wall, which is much more effective than a lone shield.

Mobile barricades are effectively multi-user shields carried by several people. These can be especially useful at the front, sides, or rear of a crowd to provide cover and prevent police from easily attacking or dispersing the participants. A simple example would be a large piece of plywood with multiple handles or a single long handle bar along the back. In a pinch, demonstrators have improvised mobile barricades out of ladders and other freely available objects—for example, at the 2010 protests against the Olympics in Vancouver. We’ve seen other mobile barricades constructed from see-through steel grating or roofing stretched across wooden frames. We’ve seen them with stands on the back so that they can stand freely on their own when set down.

To make a reinforced banner, take a vinyl or fabric banner and line it with wood, plastic, or another hard material. Reinforcement is useful simply to make banners easier to carry, but they can also be used tactically to defend the edge of a crowd.

PVC pipe is easy to purchase, but breaks easily upon impact. As a means of reinforcing banners, it has repeatedly failed, perhaps most famously in Washington DC in 2005 during protests against the second inauguration of the second President George Bush. If you’re in a hurry, green bamboo may serve—it’s surprisingly light and flexible enough to be somewhat resilient against blows.

Mind you, armor, helmets, shields, mobile barricades, reinforced banners, and other protective gear can make you stand out—and it’s rarely a good thing to stand out at a demonstration. There is no airtight protest scheme, no tactic that is guaranteed to work, no gear that solves every problem or is ideal for every situation. Think about what you want to accomplish and how the police might try

Pepper-balls: 280-350 fps, 12-15 joules, 20 meter accuracy, 50 meters+ area saturation

- White and red: LIVE, 0.5% PAVA (synthetic pepper spray)
- Black and red: LIVE-X, 5% PAVA
- White and blue: CS, 2.5% CS (tear gas)
- Blue and red: CS/PAVA, 1.25% CS and 1.25% PAVA
- White and purple: Inert, used for training or just to hurt people
- Solid green: marking, contains paint for identification
- Solid white/beige: glass breaker, designed to shatter glass and then itself shatter, not designed for use on people or animals
- Clear: water-filled, used for training or just to hurt people
- Also clear: UV marking, used to mark people with ink that can only be detected under UV light

VXR rounds: 280-425 fps, 12-28 joules, 50 meter accuracy, 130 meter+ area saturation

- Red and orange-red: VXR Live, .25% PAVA
- Red and black: VXR Live-X, 2.5% PAVA
- Blue and black: VXR CS, 1.25% CS
- Blue and red: VXR CS/PAVA, 0.625% CS Powder and 0.625% PAVA Powder
- Purple: VXR inert powder, used for training or just to hurt people
- White and black: VXR inert liquid, used for training; might containing marking paint—documentation is unclear
- Dark blue and black: VXR marking, contains paint for identification
- Also white and black: VXR UV marking, used to mark people with ink that can only be detected under UV light

- Energy: Adjustable between 10-28 joules
- Velocity: 280–425 fps
- List price: around $1200
- Ammunition list price: unknown

TIPPMANN
PepperBall
A pepper-ball launcher with a hopper.

The Pepperball VKS (Variable Kinetic System) is essentially a paintball gun designed to look and function like an AR-15 and to fire paintballs full of pepper spray or other rounds. The user can switch between feeding them via a rifle-style magazine (which can hold pepper-balls or shaped rounds) or a paintball-style hopper (that holds only pepper-balls) by rotating the barrel. They can also use two different compressed air sources: the stock itself is a compressed 13ci HPA air canister or a remote air line can connect to any compressed air tank. Online forums suggest a wide range of how many shots one can get from a 13ci tank, estimating between 80-250. The AR-style safety switch has three modes: (S) Safety, (F) Fire, and (D) Disassemble. A velocity adjustment screw sits above the trigger on the right side. The VKS comes in black-and-yellow, black-and-orange, and all black.

The manufacturer's guidelines say that the weapon is not to be fired at the head, face, eyes, ears, throat, or spine.

Police departments use pepper-balls for direct impact as well as area saturation. A Denver PD trainer says that the police use pepper-balls to saturate an area that would otherwise be dangerous to approach, to draw suspects out from hiding or cover.

The rifle fires two types of ammunition: round pepper-balls, loaded from the hopper or magazine, which are accurate up to 20 meters, and the newer form of ammunition, VXR-shaped projectiles, which are only loaded from the magazine. The VXR projectiles are accurate up to 50 meters, as they are fin-stabilized.

This rifle can fire projectiles at speeds of up to 425 fps. For comparison, most paintball fields limit guns to 280fps for safety.

Each round is color-coded. The shelf life of ammunition is 3 years.

to prevent you from accomplishing it. Be pragmatic. Mobility, speed, initiative, the element of surprise, and the sense to quit while you're ahead will usually serve you better in the streets than any item of equipment could—so make sure your gear doesn't impede or distract you from making the most of any of those.

Further Reading

To understand police tactics and mindsets, it can be helpful to peruse their training manuals:

- Technique and Use of the Police Baton—A classic from 1967.
- FM 3-19.15—This served as the foundation for all crowd control training manuals released since and the basis for domestic police training.
- Excited Delirium—A do-it-yourself protestor's guide to 'less-lethal' police weaponry from 2008.
- *Bodyhammer*, a zine that appeared shortly after the turn of the century exploring helmets, body armor, shields and shield walls, and an array of defensive tactics and formations.

A Demonstrator’s Guide to Understanding Riot Munitions

And How to Defend against Them

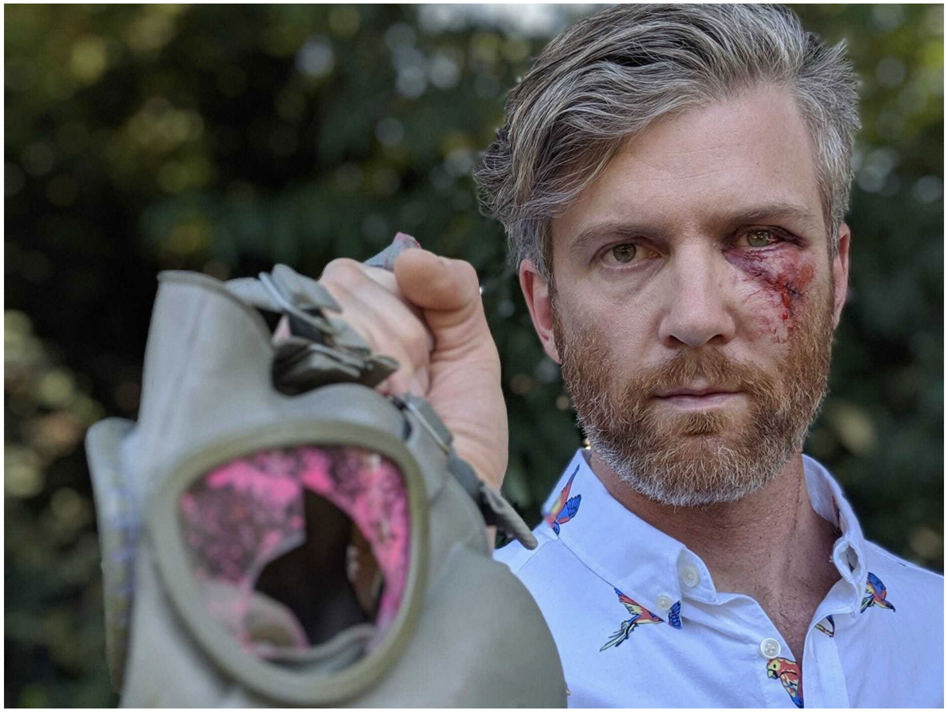
If there’s one thing that police officers prefer to hitting people with sticks, it’s shooting blunt objects and chemical weapons at people. Arms manufacturers are constantly developing new ways to assault people from a distance—and taxpayers keep buying new toys for their oppressors.

This article offers an overview of less-lethal projectiles—both chemical weapons and impact munitions. The police themselves don’t bother distinguishing the two. We’ll cover chemical weapons like tear gas and pepper spray. We’ll cover impact weapons like baton rounds, rubber bullets, and pepper-balls. We’ll cover the systems police use to apply these weapons, including air guns, sprays, grenades, grenade launchers, and shotguns. We’ll cover the ways that police mark people for arrest—and the ways they probably don’t. Other articles in this series discuss batons and other police weaponry.

This can be a scary subject. But remember—their goal isn’t to strike us with plastic bullets or spray us with chemicals. Their goal is to make us live in fear. They want us to stay home, disconnected, leaving their authority absolute and unchallenged. They fail to achieve goal every time we take the streets together. They fail every time we refuse to let that fear dictate what we do.

In this article, we’ll touch briefly on how to protect ourselves via gas masks, armor, shields, and the like. Other articles explore those options in detail. But the chief thing that can protect us against the police is solidarity. We are the ones who must keep each other safe. One shield on the front line of a demonstration can protect many people. One medic willing to treat those in the line of fire can protect many people. A few people who risk jail time to push the police back can protect many people. Our best protection against riot munitions is each other.

In 2020, Portland police shot a National Geographic filmmaker with an FN303 round; it broke the plastic lens on his Czech M10 gas mask, lacerating his eye and necessitating surgery. Weeks later, the bismuth pellets were still embedded in the skin of his face, looking like small blackheads that he has been removing himself with a needle.



In July 2020, federal agents shot Trip Jennings, a videographer who has worked with PBS and National Geographic, in the eye with a less-lethal round in Portland, Oregon.

Pepperball VKS

- Effective range of pepper-balls: 20 m
- Effective range of VXR projectiles: 50 m
- Caliber: .68
- Magazine capacity: 10-15 rounds in magazine, 180 rounds in hopper
- Weight: 6.2 pounds without hopper

barrel itself. It fires polystyrene projectiles that are fin-stabilized for accuracy. Each projectile has a front section containing tiny pellets of bismuth and a rear section containing the payload. Bismuth is essentially a non-toxic alternative to lead. The front section is designed to deliver trauma without skin penetration; but tests on ballistic gel imply that it often penetrates skin regardless, and protestors in Portland have found that the rounds can penetrate bicycle helmets. Bismuth pellets can penetrate skin and stay embedded for weeks until manually removed.

The FN303 has a 10” barrel (shorter than a rifle) and a 15-round drum magazine. The air tank can fire up to 110 shots before it needs refilling. The safety is inside the trigger guard. The entire device can be removed from its stock and mounted underbarrel on a rifle, although fortunately, we have not seen any evidence of civilian police doing so. It is also available in a pistol format, with a six-round magazine that contains a disposable carbon dioxide cartridge that powers the gun.

Each FN303 projectile weighs 8.5 grams. There are five versions on the market, each color-coded. White projectiles contain inert powder and are used for training; clear projectiles have no rear payload and are only used to hurt people; orange projectiles contain PAVA powder (synthetic pepper spray—see below); pink projectiles contain a pink, water-soluble, washable paint for marking targets; yellow projectiles contain a yellow, latex-based, indelible paint for marking targets that cannot as easily be washed off. The projectiles have a shelf life of three years when kept in their original, foil-lined packaging.

In 2004, a Boston police officer used an FN303 to shoot and kill Victoria Snelgrove. The officer was allegedly aiming at someone else in the crowd. The pellet entered her eye, breaking through bone and injuring her brain. She died of her injuries a few hours later. Studies indicate that an individual FN303 loses accuracy after a few hundred rounds have been fired through it; the FN303 was the weapon used in the aforementioned study showing how inaccurate less lethal weapons are in the hands of an operator in a stressful situation. The city of Boston discontinued the use of the FN303 as a result, as did several other cities. Boston apparently melted theirs down to make manhole covers. As of this writing, Portland police continue to employ the FN303, as many other departments around the country presumably do.

In Luxembourg, in 2009, police using FN303s for the first time shot and broke a journalist’s finger.

Courage is not the absence of fear. It is acting despite fear. Together, we can overcome fear

On Standardization and Oversight

We have found no evidence that there is any federal or state oversight of what weapons police are permitted to use to quell civil disturbances. According to an anarchist lawyer who specializes in this field, each of roughly 18,000 agencies in the US maintains its own use of force guidelines detailing internal standards regarding what its officers can do to people. We’ve found no body that certifies the chemistry employed in chemical weapons. Any given chemical weapons manufacturer chooses their own binding agents and chemical additives; it appears there is no easy way to know what chemicals we are being exposed to when police target us with these weapons. While this shouldn’t cause us to back down and accede to authoritarianism, it’s important to remember that these weapons are only “less lethal” in comparison to live ammunition.

There are only two factors contributing to standardizing these weapons. The first is that weapons that use existing projectile systems (such as 37mm launchers) are more likely to be widely adopted than oddball systems that require entirely new training and weaponry. The second is that manufacturers tend to copy each other’s innovations.

While the federal government apparently does not provide oversight, it does occasionally offer advice and suggestions—for example, in this somewhat-outdated 2004 manual of less-lethal weaponry.

Impact Munitions

Police fire a wide range of blunt force projectiles from a variety of weapons. Manufacturers and police departments sometimes call these “Blunt Impact Projectiles” (BIPs) or “Kinetic Impact Projectiles (KIPs). “Rubber bullets” are only one of many variants. They vary in size, force, composition, delivery methods, and lethality.

The sales pitches that manufacturers make to law enforcement agencies emphasize the ability to obtain compliance from subjects via projected force with minimal risk of injury or death. All of the academic studies—not to mention our lived experience—show that neither of these claims is correct: impact munitions regularly maim and kill protestors and they rarely succeed at breaking up demonstrations. They're even less effective at stopping social movements. Often, when one of us loses an eye or suffers a fractured skull, more people come out to the streets.

Some of the more common impact munitions include **baton rounds,** large plastic, foam, gel, or even wooden projectiles that are fired from a multi-launcher or occasionally a shotgun; **rubber bullets,** metal projectiles coated in rubber or PVC; **bean bag rounds,** woven bags filled with either silica or lead, usually fired from shotguns; **pepper-balls,** which are essentially paintballs filled with pepper spray; **FN303 rounds,** a combination of pepper-balls and regular impact munitions; **rubber balls,** which are rubber or plastic or foam pellets packed into grenades to explode like shrapnel or shotgun shot; and, of course, the venerable **gas canister** (bearing chemical agents or smoke), which is not designed to be fired directly at protestors—but regularly is.

Contrary to popular supposition, most modern impact munitions are designed for "direct fire" rather than "skip fire." Direct fire munitions are for shooting directly at individuals, while skip fire projectiles are designed to be skipped off the ground into the crowd. Tear gas canisters are generally intended for skip firing at close range or firing at a 25-30 degree arc into the air for maximum range; they are not rated for direct fire. Some styles of baton rounds that split into multiple projectiles are designed for skip fire to distribute the projectiles more widely, while others are designed to be fired over the heads of protesters in order to rain chemicals down. Full-size wooden baton rounds and some rubber bullets seem to be designed for skip fire as well, but in general, skip fire is less accurate and less common.

Baton rounds, stinger grenades, and beanbags hurt. They injure people. Occasionally, they maim or—even more rarely—kill people. Yet of all the tools used by the police, they are some of the least effective at stopping demonstrations. Unlike a cop within mêlée range, a baton round cannot arrest you. Unlike a cloud of gas, it can't force you to disperse. Ranged impact weapons rely primarily on pain compliance. While this may work on individuals, pain alone usually cannot force a resolute crowd to comply. Standing around getting shot at isn't always the right move. But the effects of impact munitions can be mitigated by protective equipment including shields, armor, helmets, goggles, barricades, and even umbrellas. Impact weapons rely on fear above all—and

The pistol version of the Pepperball system seems to be even less accurate than other options.

There are also a large number of "riot ball"-style munitions designed to be fired from air rifles/paintball guns (including .68 caliber and .50 caliber), though we have not collected evidence of their use in the United States. These might be anything from solid rubber balls to PVC- or nylon-coated steel pellets to D-shaped projectiles that use "First Strike" paintball guns for increased accuracy.

There is a lot of anecdotal information about paintball players suffering eye damage from ordinary paintballs. These smaller projectiles may be especially dangerous in demonstrations. That's a good reason to wear goggles.

Of the two weapon systems known to be employed by US law enforcement, the FN303 seems to be substantially more dangerous in terms of pain, injury, and death, while the Pepperball system is more tactically versatile.

FN303

The FN303

- Effective range: 50 m
- Maximum range: 100 m
- Caliber: .68
- Magazine capacity: 15
- Weight: 5 pounds
- Velocity: 295-300 fps
- Energy: 35 Joules
- List price: $1699
- Ammunition list price: $2.85-$4.65/round (paint rounds are cheaper, chemical weapon rounds more expensive)

The FN303 is a gun that uses compressed air to fire rounds at targets. While the actual barrel is small, firing a .68" projectile like other paintball and pepper-ball guns, the FN303 looks a bit like a grenade launcher from some angles because the compressed air tank sits above the barrel and can be mistaken for a larger paintball guns), 12-gauge shotguns (referred to and usually marked as less-lethal shotguns, but effectively interchangeable with any other 12-gauge shotgun), grenades, and 37 or 40mm “multi-launchers,” which are functionally grenade launchers. They also disperse chemicals with sprays, hoses, and smoke candles.

These weapons are not particularly inaccurate, manufacturers’ promises notwithstanding. Studies show that when the operators of less-lethal weapons are under stress, their vertical accuracy past 30 meters is significantly compromised. Other factors include fatigue, the weight of the launcher itself, which is significant when loaded, and the recoil of the rounds, which tend to “pull” the round up when fired. These minor differences multiply in effect over distance. What would be a one-inch variance at close range can become a difference of several feet at a longer range. This means that even if an officer chooses to aim a crowd control weapon at someone’s lower body, he could easily hit his target in the head—or hit someone else entirely. There is not a surefire way to shoot any weapon into a crowd of people and be certain to hit your intended target.

.68 Caliber Air-Powered Guns

Police use what amount to paintball guns to launch chemical agents, impact munitions, and marking rounds at people. These are .68 caliber air-powered rifles and handguns. At one time, these were used almost exclusively to shoot pepper-balls and paintballs at protestors, but it wasn’t long before one manufacturer added impact munitions to the projectiles by forgoing a round ball and making fin-stabilized projectiles that contain both chemical agents and enough metal to hurt.

PepperBall

Pepperball pistol.

There seem to be two primary manufacturers of .68 caliber “less lethal” weapons and ammunition: Pepperball and FN Herstal. We will focus on each one’s flagship rifle as an example, but police might be armed with older models of these weapons, the pistol versions of these weapons, or systems from other companies entirely.

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through mental preparation and mutual support, we can defend ourselves from fear. We can choose not to comply with fear.

All around the world, intimidation is the chief weapon of the mercenaries who serve the ruling class.

Common Injuries

Impact munitions are ostensibly designed to hurt people and cause compliance without causing significant injury. But there’s nothing safe about them.

It’s been difficult for us to parse the available data to work out which parts are applicable specifically in the United States. The largest study, from 2017, includes information from many other studies around the world. But a good portion of its data—about 41%—describes the use of rubber bullets. Rubber bullets account for a vastly disproportionate number of the serious injuries in the study, and a slightly disproportionate number of deaths. The study found that 3% of people injured with impact munitions die as a result, but that is not a useful number to understand in the context of a demonstration of the US. People do die as a consequence of impact munitions—but it will not be anywhere near 3% of those who are injured by them. We have not been able to confirm whether rubber bullets are currently in use in the US (as they are easily confused with rubber ball ammunition), but if they are, they are not the predominant impact munition in use.

The 2017 study found that the majority of serious injuries and deaths were the result of impacts to the head or neck. A smaller study from 2000 found that the majority of deaths were the result of impacts to the chest (causing ribs to break and puncture the heart or lungs).

After the type of munition fired, the most significant factors determining the severity of injuries are the distance from which it is fired and the speed with which the victim can access medical care. Attacks from within ten feet caused the greatest number of broken bones, for example. Also, street medics save lives.

The most *common* injury from impact weapons is intense bruising. And despite police lacking competence and acting with impunity, it does seem like most impact munitions are aimed where they are supposed to be aimed, at the abdomen or lower, where serious injuries are less likely to occur.

Occasionally, injuries and deaths occur when an officer fires breaching rounds (projectiles designed to break through barriers such as doors) directly at people, presumably by accident.

Three weeks into the George Floyd uprising, the American Academy of Ophthalmology reported at least 20 serious eye injuries at protests caused by impact weapons (including baton rounds, bean bag rounds, and pepper-balls), tear gas canisters, and, in one case, the probe of a Taser. These included seven instances in which people lost an eye as a result of such an incident, with many more people awaiting surgery, unsure if they would keep their eyes. In one case this year, a journalist suffered a serious eye injury after a projectile broke the protective lenses of his gas mask.

Across the world, medical specialists continue to call for the abolition of impact munitions in policing.

Protection

Based on street experience and the analysis of studies, the most vital areas to protect are the head, eyes, neck, and chest. Helmets, gorgets, sports armor breastplates, and impact-resistant goggles, face masks, or gas masks can protect against this, potentially combined with shields. The neck is the most complicated of these areas to protect; most people have never heard the word “gorget,” let alone imagined wearing one while protesting against the police. Basically, a

FN303 rounds.

There are also self-defense rounds for airguns that use a D-shaped round like First Strike. First Strike is a style of paintball round fired from a magazine instead of a hopper, designed for greater accuracy. The same system has been adapted to shoot rubber projectiles with enough force to be deadly. We’ve seen no evidence of their use by police, besides the Pepperball VXR rounds covered under pepper-balls, below, and the FN303 rounds.

Barricade Rounds

Barricade rounds are projectiles that are designed to penetrate barriers as tough as glass windows (12-gauge), hollow-core doors (37mm), or thin wallboard or plywood (40mm) and release chemical agents from their nosecone upon impact with said barrier. They are not as effective at breaking through double-pane windows or getting past heavy drapes. The rounds are not meant to be fired at people; they have killed multiple people who were struck directly by them.[5]

They carry OC, CS, CN, or inert liquid or powder. The liquid-carried ones are heavier and penetrate barricades more effectively, while powder carriers are more effective at dispersing gas. Liquid rounds come with red dye that mark where they hit.

Launchers and Dispersal Methods

Police have access to a wide variety of tools they use to project force at a distance. The most common of these include .68 caliber airguns (essentially,

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[5] Defense Technology’s barricade rounds, called “Ferret” rounds, come in 12-gauge (with 2.5” shells), 37mm, and 40mm. The 12-gauge rounds have a velocity of 1000 fps and an effective range of 50-100 meters. The 37mm reputedly has a velocity of 450 fps an effective range of 50-200 yards (though we question this 200 yard claim —it seems like a typographical error). The 40mm variety has a velocity of 325 fps (liquid) or 375 fps (powder) and an effective range of 54 yards.

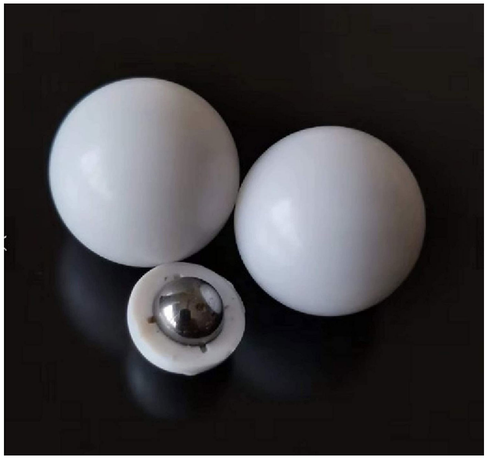
Pellets and Paintballs

More and more commonly, less lethal munitions are fired from .68” caliber airguns—which is to say, paintball guns. A few styles that we have not confirmed to be in use in the USA are covered above under “rubber bullets.” The more common styles are pepper-balls and FN303 rounds.

While both are used as impact munitions, they are unique to their individual platforms, so we’ll cover them under “launchers” below. However, fascists have lately adopted the paintball gun as a favored tool for street conflict. Rumors abound that they are using frozen paintballs, but we suspect that they may be using rubber balls.

Frozen paintballs are nearly mythical in the paintball world because local media outlets falsely claim they are favored tool of Halloween vandals. Paintballs frozen in a home freezer for 48 hours do not freeze solid; they only become slightly more brittle and tacky, and they thaw quickly. Paintballs frozen in dry ice are much more solid and potentially dangerous, but unwieldy to shoot. Liquid nitrogen frozen paintballs are as hard as ice, but so brittle they are nearly impossible to load and fire. All cold paintballs become less accurate—as the shell becomes tackier—but sting more.

In parts of the world where access to firearms for self-defense is less ubiquitous, airguns are sometimes used to deliver near-lethal force, firing pellets including solid rubber and rubber- or PVC-coated steel balls such as those covered under rubber bullets above, sometimes referred to as “glass breaker” balls. These projectiles are certainly available to US law enforcement as well as civilians; they can be fired from any paintball launcher.


"Glass breaker" balls.

Anti-fascists leaking far-right communication logs in Portland in 2020 revealed that at least one far-right militia member discussed using frozen paintballs but noted their lack of accuracy. He suggested instead using glass breaker balls, as detailed above.

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gorget is an item of neck armor worn by fencers. None of us have ever seen anyone wear one at a demonstration.

We will discuss shields in a later article. Here, suffice it to say that, to protect against impact munitions, a shield must be strong enough to resist penetration of the round, rigid enough to distribute the force of impact across a large surface area, and be backed by foam wherever the wielder’s body is in contact with it. Plywood 3/8” thick serves well enough, though 1/2” can hold up to more weaponry. Traffic barrel plastic resists penetration well but distributes the force poorly, though it is substantially lighter than wood. No shield makes you invulnerable.

Most injuries occur below the waist. It appears that the most effectively trained police prefer to shoot demonstrators in the kneecaps. In view of this, it may be worth considering wearing kneepads or more complete sports armor, not so much to avoid permanent injury or death as to remain mobile, effective, and uninjured.

Shields and barricades can help mitigate all of these potential injuries as well.

Understanding Ballistics

To understand impact, we have to understand kinetic energy.

Kinetic energy, often called muzzle energy in ballistics, is measured in joules (or in foot-pounds, if you’re not feeling metric). It’s derived from the velocity of an object and its weight, with velocity being exponentially more important. The formula to determine the kinetic energy of a projectile is Ek = (1/2)m**v**2 with Ek representing energy (kinetic), m representing mass, and v representing velocity.

None of us are engineers, but we consulted a couple in the course of writing this article. Basically, we can understand joules measuring the answer to the question “How much did I get hit with?” A baseball thrown at 90 mph might have 120 joules. A baton round might have 240 joules, hitting you twice as hard as that baseball. A .22 rifle might also deliver projectiles with 240 joules, but the baton round is a blunt impact whereas a bullet is designed to penetrate. A 9mm pistol might deliver bullets with 470 joules, an AR-15 with 1850, while a slug from a 12-gauge shotgun could approach 4500. If a 180-pound person fell from a height of 15 feet, they’d have around 4000 joules when they hit the ground. A speeding car? Easily 200,000 joules.

Yet most of us would rather get shot with a baton round than a .22. As one contributor to this text put it, “I’d rather be hit with 200 joules of marshmallows than 200 joules of baton.” Joules are far from the whole story about the damage a given projectile can inflict. The surface area it hits you with (the joules per square meter), the angle it hits you, where it hits you, and the object’s composition (a wooden baton round will absorb less of its own impact than a gel baton round, for example) all matter more. In one study, it took only 375 joules to break bones when pressure was applied at certain angles, while it took 9920 joules to break the same bones when pressure was applied at other angles.

Because velocity is more important to energy than the weight of the projectile, the energy with which a projectile strikes a target drops off quickly at distance. A faster object will often carry more kinetic energy than a slower, heavier object.

It is useful to start with the energy various weapons can deliver and the impact testing to which various pieces of protective gear are subjected. We’ve found one military document that refers to a “internationally recognized lethality limit” of 75 joules. But these factors do not give us enough information to know how a given projectile will affect a given target. While we are testing various impact munitions against various items of protective gear, we’d like to hear any anecdotes or research you can share about the effectiveness of different forms of protection against projectiles.

Baton rounds

- Material composition: plastic, foam, gel, wood
- Delivery methods: mostly 37/40mm launchers, some 12-gauge shotguns
- Velocity: most seem to be around 300 fps (feet per second), with some examples up to 650 fps
- Energy: one example is 244 joules
- Range: depends widely on composition, but an overall advertised range of between 1.5 and 80 meters

Baton rounds come in multiple shapes, sizes, and materials, but they’re basically big chunks of painful object. They tend to be large-caliber (37mm and 40mm), so that they impart as much force as possible while remaining too blunt to penetrate

situations, they are not usually employed to incapacitate people so much as to inflict a psychological impact on the crowd.

We saw one police officer on a forum telling the story of a man on PCP surviving 34 shots with beanbag rounds (though one round shattered the bones in his hand). Police on internet forums often boast about how they shoot rookies with beanbag rounds to haze them.

We found Safariland beanbag rounds for retail at $30 or available on eBay for $10. Other manufacturers charge around $6-7 per round.

Rubber Bullets

- Composition: rubber- or nylon- or PVC-coated steel, or a hard composition of rubber and silica
- Delivery method: varied

Thus far, our research into rubber bullets has been less conclusive than our research into the other rounds. Historically, rubber bullets for crowd control come in two forms: metal projectiles coated in rubber, as British occupiers used extensively in Northern Ireland, and hard pellets made of a homogenous mixture of roughly 20% rubber and 80% silica, as commonly deployed by the Israeli colonial occupation in Palestine.

We know that the police in the US are shooting people with rubber balls, and there has been some speculation that in 2020, DC police have used the steel-cored variety that have killed so many people over the years.

As metal-cored projectiles were disproportionately responsible for death and maiming in the 2017 study of less-lethal weapons, this warrants further investigation. If you see police fire rubber balls at people, try to grab some. Measure them, cut them open, and send us pictures.

There are also bullet-shaped rubber bullets designed to be fired from 9mm handguns and, presumably, every other common firearm caliber. But as these are fired from regular firearms, they do not seem to have found their way into the police riot control weapon arsenal. So far, the only manufacturer we’ve tracked down that makes this style of bullet is in Canada: Lamperd Less Lethal. It’s safest to assume that the rifles and handgun you see police carrying hold live ammunition.

Rubber balls are also packed into grenades that for all other purposes function as flash-bang grenades: disorientation devices that use sound and light to distract people. One hand grenade we looked at, the ALS Hornets Nest Sting Grenade, holds 180 .32 caliber balls and produces a flash of 1-2 million candela and a bang of 130 db at five feet.

Rubber balls move very chaotically; grenades detonated on the ground can easily send projectiles towards our faces and eyes.

These grenades are absolutely not safe to handle and should not be caught or thrown back.

Beanbags

- Composition: silica or lead in Kevlar or other fabric
- Delivery method: Mostly 12-gauge shotguns, but also 37/40mm launchers
- Range: 20-35 feet
- Velocity: ~270 fps
- Force: one 12-gauge example was 146 joules

BEAN BAG
40MM Smokeless Powder

40mm beanbag round.

Beanbag rounds are bags full of metal (such as #9 shotgun shot) or silica (sand). On average, they are for closer-range use than baton rounds; they more often used inside buildings—specifically, in jails. Every manufacturer and every round will be different, but most seem to be intended for use between 20-35 feet. Some beanbag rounds are "drag stabilized" with a bit of cloth that hangs off the back to keep it accurate its entire effective distance. They are fired from 37mm and 40mm launchers and 12-gauge shotguns.

Manufacturer's guidelines suggest that it would take 2-3 shots with a beanbag round to incapacitate a target. When they are used in riot

skin. Many baton rounds also include some kind of payload, such as chemical agents or marking dye.

Most projectiles that get called "rubber bullets" are probably baton rounds. It's not necessary to correct people pedantically, but for the purpose of this article, we're going to make the distinction and call them baton rounds instead.

FOAM
BATON
40MM Smokeless Powder

40mm foam baton round.

The most common materials for baton rounds are plastic, foam, gel, and wood. While there are far too many varieties list at length, and different manufacturers use different materials for different purposes, the general idea seems to be that foam rounds tend to be intended for short-range fire while plastic and wood are intended for longer range applications. Gel rounds are advertised as being useful at short or long range, as are "collapsible head" plastic rounds. Of course, it's hard to imagine the police really thinking through exactly which round they want to use for which tactical purpose, especially in chaotic situations, and it's safe to assume that they are firing all of these at any range they want.

Baton rounds often contain multiple projectiles within each shell that are designed to split apart.

Some baton rounds have rifling built into the shell or into the barrel of the launcher to spin-stabilize the projectile for accuracy. Most appear not to. While every baton round is rated to a different range, most seem to be designed for use between 2 and 40 meters; only a few varieties are designed for up to 80 meters.

Direct fire baton rounds are supposed to be aimed at the navel, thighs, buttocks, or knees—though as previously mentioned, it is a mistake to expect police to limit themselves thus.

Most people struck with baton rounds just come away with a nasty welt. However, baton rounds have maimed and killed people, especially when they strike people's faces. In July, Portland police shot a 26-year-old protestor in the face with a baton round while he had his hands up. We believe that round to have been a Sage International 37mm KO1 round. The blow fractured his skull, nearly killing him and necessitating surgery.

WOOD BATON
37 MM Black Powder

37mm wooden baton round.

There are also 12-gauge shotgun baton rounds. Most of these are various rubber projectiles that have fins and look like tiny missiles or rocket ships. One, for example, the stabili-shock, weighs 6 grams and is meant to fire at 426 fps for a total of 51 joules of force. We found one video of someone loading the round wrong and shooting it at three times that velocity. We have seen some evidence of police using these at protests in the US.

Another make is the Lightfield Superstar, a colorful sea urchin of pain. It is a close-quarters weapon, considered safe for direct fire at as close as two meters. We have found no evidence of law enforcement using these in the US.

Baton rounds seem to have been invented by the British for use in their colonial project in Ireland, because the rubber bullets they were using at the time were killing too many people. Plastic baton rounds still killed colonial subjects, but at a slower rate.

Modern baton rounds often contain one or more chemical weapons, including OC (Oleoresin capsicum) and CS (common tear gas) most commonly, though CN (which is more dangerous) is used as well. Some baton rounds also contain marking compounds.

Rubber Balls

- Composition: hard rubber
- Delivery methods: hand-thrown grenades, 37/40mm canisters, 12-gauge shotguns, possibly .68 caliber air guns
- Velocity: variable

- Energy: 30-200 joules when fired from a shotgun, other styles unknown
- Range: widely variable

ALS
ALSG101 HORNET'S NEST
AMTEC Less-Lethal Systems, 4700 Providence Road
*FOR USE ONLY BY PROPERLY TRAINED

A sting-ball grenade.

Rubber balls are fired individually or, more often, packed into shotgun shells, multi-launcher shells, or hand-thrown grenades. They shoot out wildly and injure people unpredictably. Brand names include Stinger, Sting-ball, and Hornet’s Nest; they are sometimes generically described as rubber buckshot. We’ve found a few common calibers of balls: .32 caliber and .60 caliber (which is to say .32” and .6”), are common in grenades and larger canisters, while “rubber buckshot” seems to come in 00 buckshot size: .33”. Some shotgun rounds are packed with one to three .68” rubber balls.

According to one manufacturer, rubber ball weapons are considered a weapon of last resort when other less lethal options have failed. This is probably because rubber balls are unpredictable in who they strike and where.

It’s possible, though we have not been able to confirm it, that most of what people describe as rubber bullets in the United States are the larger caliber of rubber ball. Combined Tactical Systems Sting-balls are in common use in Portland—they are presumed to be the means by which police broke someone’s finger in August. Anecdotally, a lot of them seem to misfire, as demonstrators have found a large number of improperly-deployed canisters.

12-gauge stinger balls.

There is speculation that expired rubber balls lose some elasticity over time and become more hazardous.